THE

AMERICAN JOURNAL OF PHARMACY.

OCTOBER, 1848.

ART. LIV.—ON QUASSIA AMARA, *Linnæus.*

By J. Carson, M. D., &c.

(*With a Plate.*)

The *Quassia amara* belongs to the family Simarubeæ, *Richard.* Simarubaceæ, *Lindley.*

The *Essential Characters* of this family are:—*Flowers* hermaphrodite, or by abortion unisexual. *Calyx* four or five-parted, persistent, imbricate in aestivation. *Petals* equal in number to, or alternate with, but longer than the divisions of the calyx; aestivation twisted, deciduous. *Stamens* equal in number, or twice as many as the petals, inserted on a hypogynous disk, free. *Ovary*, with the lobes as numerous as the petals; *style* one, filiform, enlarged at base. *Carpels* as many as the petals, articulated on the axis, capsule bivalved, dehiscing inwardly, monospermous. *Seeds* ex-albuminous, pendulous; *cotyledons* two, thick; *radicle* short, superior. Trees or shrubs, leaves alternate, pinnate without stipules. *(De Candolle.)*

It is a small family, and a remarkable analogy exists between all the members of it. A principle, bitter and tonic, has been detected in them, upon which their medical properties depend; this is the same in all, and has, from the

generic name Quassia, been called *Quassin.* A milky juice is said to exude from the bark. They are tropical plants, and are found in the eastern and western hemispheres.

QUASSIA AMARA belongs to Decandria, Monogynia, *Lin.*

GENERAL CHAR. *Flowers* hermaphrodite. *Calyx* short, persistent, prominent, with five deep divisions. *Petals* five, much longer, arranged in a tubular form, twisted in aestivation. *Stamens* long, exserted, provided at base with a hairy scale. *Ovaries* five, placed on a broad receptacle. *Styles* five-partite below, but united into a long exserted one with a five-furrowed *stigma.* *Fruit* drupaceous.

SPECIFIC CHAR.—A small *tree,* from six to ten feet high, straight, irregularly branched, with an ash coloured, smooth bark. The *leaves* are sparse, occupying generally the summit of the branches, very smooth, pinnate; *leaflets* sessile, in pairs, usually two with an odd one, entire, elliptical, acute, reticulated, a little revolute on the margin, of a deep green, with a reddening of the veins above, and lighter beneath; *petiole* winged, with the joints cuneate. *Racemes* long, simple, terminal. *Flowers* large, scarlet, with short pedicels and a recurved bract at base. The *fruit* is black and ovoid.

This plant is a native of Surinam, Guiana, and other parts of South America. It is cultivated in the West Indies. A specimen in our possession came from the garden of Dr. Stevens, of St. Cruz.

The merit of having first directed the attention of the scientific world to the virtues of the plant, by some authorities has been awarded to Mr. Rolander, by others to Mr. Dahlberg. It appears that a negro by the name of *Quassi,* at the time of Mr. Rolander's (a Swedish naturalist) sojourn in Surinam, was in the habit of treating the fevers of the country with the root. This was procured by him, and taken to Europe about the year 1756. He supposed that

it was derived from the *Zygophyllum aestivans*, a plant belonging to RUTACEAE. Through Mr. Dahlberg, however, whose popularity was great as a counsellor and military officer, the secret became known. The tree affording the remedy was pointed out to him, and after cultivating it in his garden, he transmitted specimens of the organs of fructification preserved in spirit to Linnæus, who determined its true position under the name *Quassia amara*. The first full specific account, with a drawing, was published under the auspices of Linnæus, by Dr. Blom, in an inaugu ral essay, in the "Amoenitates Academiæ," for 1763, vol. 6.

By Pereira* we are informed that "Fremin mentions that, about the year 1714, the flowers of this shrub were highly valued at Surinam, on account of their stomachic properties." "In 1730 the root is said to have been found in the collection of Seba, a celebrated spice dealer of Amsterdam." Haller, in the *Biblioth. Botan.* ii. 558, refers to it as having been well known in 1742.† That Quassia was known as a remedy, long before the tree was described, is evident from the statement of Dr. Blom,‡ that Linnæus was in the habit of lecturing on the virtues of the wood. But whether this knowledge dates farther back than the return of Mr. Rolander, the period of its introduction specified by Sprengel,§ is a point not easily settled. If the flowers were used in Surinam, Rolander would not have supposed the plant to be a *Zygophyllum*, nor would Linnæus have given sanction to such a mistake, by publishing it as such in his Sp. Pl. 2d ed., a mistake corrected when the flowers &c., were given to him by Mr. Dahlberg. The English authorities did not adopt the article for some time. In Lewis' Dispensatory for 1768, no mention is made of it, and none is to be found in the Lectures of Dr. Cullen, published in 1773. In his Materia Medica, Cullen mentions it as a bitter tonic,

* Mat. Med. † Merat. and De Lens. ‡ Amoenitates Academ.
§ Hist. de la Medicine.

and refers to Murray's Apparatus Medicaminum for an account of the drug.

The wood, in fact all parts of the tree, are possessed of intense bitterness, this is owing to the principle *Quassin*. Although this plant does not afford the article now used, a more fruitful source having been discovered in the Jamaica tree, it is of high interest as having produced the originally introduced article.

ART. LV.—ON KALMIA LATIFOLIA.

By Charles Bullock.

(*Extracted from an Inaugural Thesis.**)

With a view of ascertaining the proximate chemical constituents of the Kalmia, and more especially that to which its action on the animal economy is due, the leaves were subjected to the following experiments:

Dr. Stabler, of Alexandria, was of opinion that the activity of the plant is due to a volatile oil; an opinion not altogether reconcilable with the fact that he found the decoction more active than the substance, when taken into the stomach.

1st. Both the infusion and decoction gave copious precipitates with sub-acetate of lead, lime water, and proto-nitrate of mercury; the latter, after the solution had been deprived of its tannin by means of gelatin.

2d. The addition of per-chloride of iron to the decoction,

* For the Botanical and Medical history of this plant, the reader is referred to an article by Dr. Stabler, in the 16th vol. page 241, of this Journal, on which account we have omitted the first portion of this thesis.—Eds.

caused a deep brown colour; solution of gelatin, a cloudiness without precipitate.

3d. Tinct. of iodine did not detect the presence of starch.

4th. A cold infusion was made by macerating the leaves in water for two weeks. After filtering, it was clear and colourless. A portion was heated to 212°, but no coagulation took place.

To another portion, a solution of corrosive sublimate was added; it immediately became cloudy, and soon a light coloured precipitate took place, which was much accelerated by a gentle heat. This precipitate was soluble in a solution of carbonate of potassa, but was again precipitated upon the addition of sulphuric acid in excess.

5th. The addition of a solution of nitrate of silver to the infusion caused a black precipitate; solution of proto-chloride of tin, a dirty white precipitate.

6th. One ounce of green leaves was digested in 4 oz. of absolute alcohol for two days. The tincture, when filtered, was of a deep green colour. On the addition of water it became cloudy, and upon standing deposited a green resin which was insipid, melted by the application of heat, and burned with a smoky flame.

7th. Two ounces of the leaves were digested in half a pint of sulphuric ether for two days. The ethereal tincture had a bright green colour, and the sweet nauseous taste of the leaves.

On decanting it, a stratum of a light red colour and syrupy consistence separated, which was removed from the supernatant ether. Its taste was very astringent, and it afforded a copious yellow precipitate with gelatin, and a greenish black one with per-chloride of iron. The colour of the precipitate, with the salts of iron, indicated that the tannin differed from that which exists in oak bark which affords bluish black precipitates with the same salts.

The ether, after the separation of the tannin, was allowed to evaporate spontaneously: an extract was obtained which was re-dissolved in alcohol to separate the resin, and chlorophylle; no fixed oil could be separated, although the extract left by the ether had a greasy feel, and had the appearance of a small portion of oil existing in it.

8th. The leaves were treated in the manner directed by the U. S. P., for obtaining veratria: the product was a reddish brown extract, having a slightly bitter, sweet, and astringent taste, but did not possess any properties that would lead to the supposition of its possessing the peculiar virtues of the plant.

9th. The method for obtaining quinia, lobelina, sanguinarina, and various alkaloids, and proximate principles were tried, but without any satisfactory results.

10th. Two ounces of the leaves were treated with half a pint of sulphuric ether, the tannin separated, and the ether allowed to evaporate. The extract was treated with warm alcohol, which dissolved the resin and chlorophylle and left a white flaky mass, which, when thrown upon a filter, washed with cold alcohol, and dried, was found to be insipid, and was insoluble in water and cold alcohol, partially soluble in boiling alcohol, and readily soluble in ether. It was inflammable and burned with a white smoky flame, proving by its properties to be wax.

11th. Four ounces of the dry leaves in powder were distilled in a glass retort with sufficient water to cover them. The distilled water was returned upon an additional four ounces of the leaves and again distilled; the water possessed the odour of the leaves, but was perfectly clear. It was then saturated with chloride of sodium and allowed to stand for several days, but not the slightest lactescence was observable.

12th. Two pounds of the fresh leaves were introduced

into a metallic still, with a sufficient quantity of water; a gradual heat was then applied until half a gallon had distilled over. This was returned upon another portion of leaves, and again submitted to distillation, and the process continued until several pounds of the leaves were consumed. The distilled water was clear and transparent, and did not evince, in the slightest degree, the presence of a volatile oil, even after standing several weeks.

13th. A decoction of the green leaves was treated with sub-acetate of lead to precipitate the gum tannin, and colouring matter, and after filtering to separate them, saturated with hydro-sulphuric acid to precipitate an excess of lead: the clear liquid was then boiled to expel the sulphuretted hydrogen, and slowly evaporated. A reddish brown translucent extract was obtained, having a hot and acrid taste. A portion of this extract was dissolved in alcohol, boiled with animal charcoal, filtered, and allowed to evaporate, but without any thing farther being obtained.

Another portion was dissolved in water, the acetic acid present saturated with magnesia, sulphuric ether added, and after repeated agitation allowed to separate; it was then decanted and spontaneously evaporated; the product was a very small portion of straw coloured matter, which possessed the acridity of the extract and which seemed to be the acrid matter of the plant. It was but sparingly soluble in ether, for on re-evaporating the dissolved extract it was found to be still very acrid. In sensible properties, this substance resembled the acrid matter which exists in the Arum triphyllum; it was not dissipated by boiling, although much injured, or even destroyed by long continued high temperature. Several attempts were made to obtain it in an isolated condition, but without success, and consequently no satisfactory proof relative to its medicinal activity could be arrived at, but from its properties it was presumed that if taken into the system in sufficient quantity, it might, from

its acrid nature, produce the peculiar effects, attributed to the plant.

A third portion of the extract was treated with boiling alcohol of the sp. gr. .800 and the alcohol decanted and thrown upon a filter; on cooling, a white gelatinous matter was deposited in the filter, owing to its insolubility in alcohol a little below its boiling temperature. When dry this matter presented a greyish white amorphous mass, slightly sweet to the taste; it was freely soluble in water but insoluble in cold absolute alcohol and ether, answering in its properties to mannite.

The remainder of the extract from which the last mentioned substance was obtained, was insoluble in ether and alcohol, but soluble in water. It was of a brown colour, insipid, and afforded a copious precipitate with nitrate of silver, which are the properties of what is termed extractive matter.

14th. Four hundred grains of the dried leaves were incinerated in an open crucible, the remaining ashes weighed fourteen grains; these were digested in two ounces of water and pure nitric acid added until effervescence ceased; it was then filtered: with a portion of this, oxalate of ammonia gave a copious white precipitate. Ferro-cyanide of potassium caused a blue colour, and on standing deposited a precipitate of prussiate of iron. To another portion, a solution of chloride of platina was added; after standing some time a yellow precipitate of chloride of platinum and potassium was formed. Another portion, containing carbazotic acid deposited fine yellow crystalline needles, which deflagrated by application of heat.

From these experiments the constituents of the leaves of the Kalmia Latifolia are inferred to be—Gum, Tannin, Resin, Chlorophylle, Fatty Matter, a substance resembling Mannite, an Acrid Matter, Wax, Extractive Matter, Vegetable Albumen, Yellow Colouring Matter, Lignin, and Salts of Lime, Iron and Potash.

ART. LVI.—A CONCISE HISTORICAL SKETCH OF THE PROGRESS OF PHARMACY IN GREAT BRITAIN. INTENDED AS AN INTRODUCTION TO THE PHARMACEUTICAL JOURNAL. By Jacob Bell, London, 1843. John Churchill: pp. 108.

The early history of our art in Great Britain, must have a direct interest for the American pharmaceutist, as in many respects we are a scion of the English stock, changed in many of its features by growth in a distant soil, and much modified by influences from continental Europe, which, until recently, the exclusiveness of the English have excluded from their borders to a great extent. But a few years have elapsed since pharmacy here was in the hands of the physician's assistant, at his own office, and the apothecary, as now existing, was a character almost unknown in our country. These few years have witnessed a marvellous change in the relations of these two branches of the medical profession not less rapid than advantageously progressive, and it will not be the least interesting feature of this notice of Mr. Bell's work, that it will afford us the means of contrasting the history of our development with that of our British fathers.

Mr. Bell observes: "At the period at which our history commences, pharmacy was in the hands of the physicians, who professed the healing art in all its branches, and prepared their medicines themselves, or superintended the preparation of them. The science of medicine was so little understood and so imperfectly cultivated, that it was in general practised empyrically, and was often confounded with sorcery and witchcraft. The Greek word Φάρμακον signifies either to practise witchcraft or to use medicine, and this acceptation of the term was acted upon in our country as late as the 16th century. There were, therefore, persons

of various classes, both men and women, who professed to cure disease, some by incantation, others who considered that by their genius they were 'cut out and configurated for it,' and others, again, who had obtained a kind of traditional education from recognized physicians, and who, therefore, constituted the medical profession."

At that time no laws existed for the protection of the public, on the one hand, nor the physician on the other. The first act of Parliament, bearing on the profession, was passed in the year 1511, and is entitled, "AN ACT FOR THE APPOINTING OF PHYSICIANS AND SURGEONS." 3d Henry VIII. c. 9.

It commences thus: "For as much as the science and cunning of Physick and Surgery (to the perfect knowledge of which be requisite both great learning and ripe experience,) is daily within this realm exercised by a great multitude of ignorant persons, of whom the greater part have no manner of insight in the same, nor in any other kind of learning; some also can read no letters on the book, so far forth that common artificers, as smiths, weavers, and women, boldly and accustomably take upon them great cures and things of great difficulty, in the which they partially use sorcery and witchcraft, partly apply such medicines unto the disease as be very noxious, and nothing meet, therefore, to the high displeasure of God, great infamy to the faculty, and the grievous hurt, damage, and destruction of many of the King's liege people, most especially of them that cannot discern the uncunning from the cunning. Be it therefore, (to the surety and comfort of all manner of people,) by the authority of this present Parliament enacted, That no person within the city of London, nor within seven miles of the same, take upon him to exercise and occupy, as a physician or surgeon, except he be first examined, approved, and admitted by the Bishop of London, or by the Dean of St. Paul's, for the time being, calling to him or them

four Doctors of Physic, or for Surgery, other expert persons in that faculty; and for the first examination such as they shall think convenient, and afterward alway four of them that have been so approved." * * *

The same discretionary power was delegated by the bill to the Bishops of other dioceses away from London.

This act invested the faculty of medicine in a body of persons who practiced medicine, surgery, and pharmacy. The physician's assistants were called apothecaries, who gradually assumed practice on their own account, and gave rise, ultimately, to the extensive body now known in England as apothecaries or general practitioners.

A College of Physicians was established in 1518, at the suggestion of Thomas Linacre, the physician of Henry VIII. Its powers were increased in 1540, the physicians were excused from attendance on juries and parochial offices, and were empowered to enter the apothecaries shops of London, "to search, view, and see the apothecary's wares, drugs and stuffs," and to destroy such as they found corrupt or unfit for use. At the same period the barbers and surgeons had their rights invested in one company, with the proviso that the surgeons should not practise shaving, nor the barbers any surgical operations except drawing teeth.

There having been an abuse of privileges on the part of the surgeons, an other Act was passed two years after, which, after enumerating the chief points of the previous law, says: "Sithence the making of which said act, the Company and Fellowship of Surgeons of London, minding onely their owne lucres, and nothing the profit or ease of the diseased or patient, have sued, troubled and vexed divers honest persons, as well men as women, whom God hath endued with the knowledge of the nature, kind, and operation of certain herbs, roots and waters, and the using and ministering of them to such as have been pained with customable diseases, as women's breasts being s re, a pin

and the web in the eye, uncomes of the hands, scaldings, &c., and such other like diseases. * * * And yet the said persons have not taken any thing for their pains or cunning. * * In consideration whereof, and for the ease, comfort, and succour, help, relief, and health of the King's poor subjects, inhabitants of this, his realm, now pained or diseased, or that hereafter shall be pained or diseased, Be it ordained, &c., that at all time from henceforth, it shall be lawfull to every person being the king's subject, having knowledge and experience of the nature of herbs, roots, and waters, &c., to use and minister, * * according to their cunning, experience and knowledge, * * the aforesaid statute * * or any other act notwithstanding."

This act has reference to the practice of medicine without remuneration, and was taken advantage of by empirics to evade the law, notwithstanding which, however, numerous prosecutions occurred, during the reigns of Queens Mary and Elizabeth.

"In 1553, the College of Physicians obtained a new act, [1 Mary c. 9.] in which their former powers were confirmed and enlarged, and in which it is stated that 'the four censors or any three of them, shall have authority to examine, survey, govern, correct and punish all and singular physicians and practisers in the faculty of physic, apothecaries, druggists, distillers, and sellers of waters and oils, and preparers of chemical medicines'—according as the nature of his or their offences may seem to require."

The powers thus granted were not a dead letter, as many years after, Dr. Alexander Leighton was reprimanded and lost his ears, for malpractice.

Somewhere in the latter part of the 16th century, the London physicians gradually repudiated pharmacy, and it naturally fell into the hands of their assistants, and an inferior class of their own body. In 1606, these apothecaries were incorporated into a company, in conjunction with the gro-

cers, who also sold drugs, but in 1617, they obtained a separate charter, and it was made unlawful for surgeons to sell medicine, or grocers to keep apothecary's shops. They were also empowered to search shops and examine drugs. Soon after uniting their interests in a corporate capacity, they established [1623] a dispensary for making some of the more important preparations, which was placed under the superintendance of a committee.

The first British Pharmacopœia was published by the London College of Physicians, in the year 1618, and was the first attempt at reducing the confused and incongruous mass of recipes and materials to a regular standard, and it succeeded but imperfectly. Its subsequent editions were issued in 1621, 1632, 1639, 1650, 1677, 1721, 1746, 1788, 1809, 1824, and 1836. Notwithstanding the several revisions of this work from 1621 to 1650, inclusive, Culpeper, in a translation of the edition of 1650, thus speaks of some of the items of the list of materia medica. The words in parentheses are his remarks: "*The fat, grease, or suet of a duck, goose, eel, bore, heron, thymallos,* (if you know where to get it,) *dog, capon, beaver, wild cat, storck, hedge hog, hen, man, lyon, hare, kite or jack,* (if they have any fat I am persuaded it is worth twelve pence a grain,) *wolf, mouse of the mountains,* (if you can catch them,) *pardal, hog, serpent, badger, bear, fox, vultur,* (if you can catch them) *album, græcum, east and west benzoar, stone taken from a man's bladder, viper's flesh, the brains of hares and sparrows, the rennet of a lamb, kid, hare, and a calf, and a horse, too,* (quoth the colledg.] [They should have put the rennet of an ass to make medicine for their addle brains.] *The excrement of a goose, of a dog, of a goat, of pigeons, of a stone horse, of swallows, of men, of women, of mice, of peacocks, &c.*"

Culpeper, although styling himself "*Nich. Culpeper, Gent., Student in Physick and Astrology,*" and possessed of many superstitious notions, derived from the ancients or

his own cogitations, undoubtedly was useful in his day in advancing the cause of correct practice. His tendency was to the vegetable materia medica, and some of his observations relative to the gathering and curing of plants, and some processes of our art, are worthy of remembrance.

The difficulties and jealousies incident to pursuits so closely allied as medicine and pharmacy, were visible in the youth of their separation, as is evident from the remains of the literature of that period. In a pamphlet published in 1671, entitled, "*The Wisdom of the Nation is Foolishness*," the following remarks are found:

"Dr. *Merret*, a collegiate physician of London, and a practiser of thirty years with apothecaries, gives this account of them in his book lately put forth (page 8.) They use medicines quite contrary to the prescriptions,—myrtle leaves for senna, &c. * * They falsify the grand compositions of the London Dispensatory. * * (Page 9.) Tis very common for them to load medicines with honey and other cheaper ingredients, and to leave out in whole or in part those of greater value. * * Such CHYMISTS which sell preparations honestly made, complain that few apothecaries will go to the price of them. * * All the drugs imported into England, sooner or later, are sold or made into medicines, although they have lain by years with the *Merchant*, *Druggist* and *Apothecary* before they are used."

About this period the number of mineral remedies was sufficient to engage a separate class of men in their fabrication. Many of these doubtless were alchemists, and it is a well established fact that many chemical discoveries of value were brought to light during the persevering and enthusiastic pursuit of the *Elixir of Life* and the *Philosopher's Stone*, by those genii of the laboratory, as the following process of Raymond Lulle, quoted by Mr. Bell from Dumas, will exhibit:

"To make *the elixir of sages* or *the philosopher's stone*, (and by this word *stone* the alchemists did not mean literally

a stone, but a certain compound having the power of multiplying gold, and to which they almost always attributed a red colour,) to make the *elixir of the sages*, take the *mercury of philosophers*, (lead,) calcine it until it is transformed into a *green lion* (massicot;) after it has undergone this change, calcine it again until it becomes a *red lion* (minium.) Digest in a sand bath this *red lion* with *acid spirit of grapes*, (vinegar.) Evaporate this product, and the mercury will be converted into a kind of *gum* (acetate of lead) which may be cut with a knife; put this gummy matter into a luted curcubit and distil it with heat. You will obtain an insipid phlegm, then spirit, and red drops. Cymmerian shades will cover the curcubit with their sombre veil, and you will find in the interior a true dragon, for he eats his tail (i. e. the distilled liquor dissolves the residuum.) Take this black dragon, break him on a stone, and touch him with red charcoal; he will burn, and assuming a glorious yellow colour, he will re-produce the *green lion*. Make him swallow his tail, and distil this product again. Lastly, rectify carefully, and you will see appear *burning water* and *human blood*, (a reddish-brown oil obtained in the process which has the property of precipitating gold from its solutions.)"

The Apothecaries' Society, founded as before stated in 1617, continued to flourish, and in 1671 they established a chemical laboratory in conjunction with the dispensary. In 1682 they became a trading body, and supplied the navy. In 1694 apothecaries were exempted from serving as constable, scavenger, and other parochial duties, and from juries. By this time their number had increased from 114, at the origin of the act of incorporation, to 1000. "They had become an influential body; and by practising medicine as well as pharmacy, they excited the jealousy of the physicians, who suffered materially from this encroachment, and endeavoured to reduce their rivals to their original condition of grocers and venders of drugs. The contest rose to

a great height; on one side it was alleged that the improvement that had taken place among the apothecaries was a great benefit to the public, and that the physicians, by endeavouring to restrain them, were undoing what the labour of their predecessors had accomplished. While the other party animadverted on the extortionate charges of the apothecaries, and the loss which the public sustained by being deprived of the advantage of the best advice in many cases for which it was impossible to pay both the physician and the apothecary."

It appears that the evil complained of induced a number of physicians to establish dispensaries, at which medicines were supplied on reasonable terms by assistants, who dispensed them under their directions. An instrument of writing to this effect was published by the President, Censors, &c., of the College of Physicians, subscribed to by fifty-three of their number, in which each subscriber obligated himself to put ten pound sterling in a common fund, to be devoted to the support of dispensaries, where medicines could be had by the poor at low rates, and to which the physicians interested could send their prescriptions. Three of these establishments were put into operation in February, 1697, and soon grew sufficiently formidable to call forth the opposition of the apothecaries, to whom they gave great offence. Mr. Bell quotes the following effusion of one Garth, in his "Dispensary."

> "Our manufactures now the Doctors sell,
> And their intrinsic value meanly tell;
> Nay, they discover, too, (their spite is such,)
> That health, than crowns more valued, costs not much;
> Whilst we must shape our conduct by these rules,
> To cheat as tradesmen or to starve as fools."

The contest between the rival interests continued to rage, pamphlets were written, filled with crimination and abuse, each party endeavouring to prove the motives of the other to be bad. As a natural consequence, the physicians, whose aim

in establishing the dispensaries appears to have had special reference to the poor, were led to advise their wealthy patients to patronize them for the following reasons, viz:

"*First.* Because physicians prescribing for them were assured that the medicines were undoubtedly the best.

"*Secondly.* Because many excellent remedies are there deposited, which have never yet been trusted in an apothecaries' shop.

"*Thirdly.* Because the physician was not obliged to prostitute his honour and conscience, by overloading his patient to oblige a craving apothecary, or run the risk of being undermined in his reputation by slanderous suggestions, by not submitting to the apothecaries' under-pick-pocket.

"*Lastly.* Because he could serve his patient, quantity for quantity and quality for quality, fifteen shillings in the pound cheaper than anywhere else: which is a thrift the greatest man that does not love to be cheated, need not be ashamed of."

To justify these declarations, instances of extortion were brought forward, one of which seems so incredible that we quote it.

"Apothecary's bill for attending Mr. Dalby, of Ludgate Hill, five days, total amount £17 2*s.* 10*d.*" of which the following items had reference to *one* day.

August 12*th.*	*s.*	*d.*
An emulsion,	4	6
A mucilage,	3	4
Jelly of Hartshorn,	4	0
Plaster to dress blister,	1	0
An emollient glister,	2	6
An ivory pipe armed,	1	0
A cordial bolus,	2	6
The same again,	2	6
A cordial draught,	2	4
The same again,	2	4
Another bolus,	2	6
Another draught,	2	4
A glass of cordial spirits,	3	6
Blistering plaster to the arms,	5	0
The same to the wrists	5	0
Two boluses again,	5	0
Two draughts again,	4	8
Another emulsion,	4	6
Another pearl julep,	4	6
	£3	3 0

Dr. Pitt, six years after the establishment of the dispensaries, in his pamphlet entitled "*The Craft and Fraud of Physic Exposed,*" states, that the three dispensaries made up about twenty thousand prescriptions annually, and that the doses one with the other might average a penny a piece.

The next year, 1704, an apothecary published a small book called "TENTAMEN MEDICINALE, *or an enquiry into the differences between* DISPENSARIANS *and* APOTHECARIES, *wherein the latter are proved capable of a skilful* COMPOSITION OF MEDICINES, *and a rational practice of Physick, to which are added some* PROPOSALS *to prevent their future increase,*" in which he takes up the charges of Dr. Pitt, endeavours to disprove some of his assertions, and remarks that "when a physician has got a guinea for his visit, it seldom much concerns his honour or conscience how the apothecary gets a shilling for his medicines."

This war of words, which long continued, only tended to widen the breach between the physicians and apothecaries, and is particularly interesting to pharmaceutists, as the origin of their rise and progress as a distinct class of the medical body in England. The dispensaries prospered and increased, the assistants at first instructed by physicians in the crude pharmacy of the period, necessarily improved their art by confining their attention exclusively to it. The physicians having accomplished, in great measure, their object, were not disposed to assume the trouble and oversight of the dispensaries longer than was necessary, and the individuals who had charge of them, on the contrary, were strongly disposed to assume the independent condition of masters. These persons were therefore the original "Chemists and Druggists" of England, the progenitors of that very extensive body now represented by the Pharmaceutical Society.

In 1723 further difficulties occurred between the physicians and apothecaries, some of the former having behaved in a very arbitrary manner, in reference to one Goodwin, (as it afterwards appears without sufficient cause,) entered his shop during his absence, condemned certain of his drugs, and burnt them in the street before his door. This act was again committed by them, and although the utmost endeavours of Goodwin could not repeal the law, yet he obtained £600 damages.

These inquisitorial visits were occasionally marked with some laughable anecdotes. On one of these occasions an apothecary placed by accident or design on his counter a jar labelled "*Ung: Album*," which contained græcum album, (white dog's dung.) The medical gentlemen seized on the jar, each giving his opinion of the quality of the *simple ointment;* one said it was too hard, another that it did not smell enough of the camphor, a third averred that it should be malaxated with oil, whilst the last got in a passion and was for throwing it out at once, at which the shop boy, who had been amused with their remarks, objected, said it was a good medicine, and told them what it was.

The Pharmacopœia of 1721 rejected many useless items of the materia medica, but it was not until 1746 that that work became a rational formulary. The number of compound syrups and ointments was greatly reduced, as was the very complex electuaries, plasters, &c. Yet the formulæ for *Mithridate* with forty and *Theriac* with sixty ingredients were retained.

In 1748 the Apothecaries Company obtained chartered powers to license apothecaries to sell medicines in London, or within seven miles, and gave them the authority to visit shops and examine drugs within their limits. This acquisition of power caused difficulties amongst the apothecaries and produced another pamphlet war. On one occasion, an

apothecary who had suffered imposition from the visitors, had his store entered by them during his absence. Having called for his jar of Mithridate, they pronounced it unfit for use, and demanded the usual fine, when just at that moment the apothecary returned, and on learning their opinion of his Mithridate, he said:

"Nay, now I am convinced what a nest of villains I have to deal with, who being nettled at my refusing their usual imposition, begin to show their knavish principles by condemning medicines of their own compounding."

He then verified his assertion, by producing the invoice and witness who brought the Mithridate from the Apothecaries Hall.

Soon after the grant of power last mentioned, the Apothecaries Company petitioned parliament for power to search the shops of *Chemists* also, but this power was not granted. This attempt caused much altercation between the chemists and apothecaries, with a mutual development of improper professional conduct. We will give another of Mr. Bell's quotations, as illustrative of the *quality* of the charges, taken from "*The Apothecary Displayed.*" In reference to the statements that druggists mix impure drugs in their compounds, it says:

"It is almost impossible for men to be more diligent and careful, or to take more pains than they do; how often may you see them with a *seron of bark*, first sifting away the dust, then separating the small sort, dividing the large and woody from the more delicate and curious quill; while they are thus cleansing, sorting, and dividing their drugs, one or other of the most eminent Apothecaries alights from his chariot at the door, and buys up all the raspings of the rhubarb, the siftings of the bark, and the sweepings of the shop. Does he buy it to burn, think you, or conscienciously destroy it for the good of mankind? (as they would make you believe in their petition.) No, he says he wants it for

powder, or it will do well enough for the tincture or syrup, or if perchance he purchases four ounces of the better sort only to keep in a glass and show his customers, has he not four pound of the worst sort with it? * * * If the Druggist beats in the dross with the drug, where has he the dross to beat in by itself? You know the Apothecary bought that, and could *he* be supposed to beat in the dross by itself, what the DEVIL becomes of the drug?"

The first Edinburgh Pharmacopœia was published in 1699, and new editions have appeared in 1722, 1736, 1744, 1756, 1774, 1783, 1792, 1803, 1804, 1806, 1813, 1817, 1839, 1841.

The next epoch in our history has reference to the general meeting of the Apothecaries in 1794, held at the *Crown and Anchor* Tavern, London, to devise means to put a stop to the encroachments of the Chemists and Druggists. The following extract from their Report will show the rapid increase in numbers and power of that class of men, who we have seen originate as assistants in the Dispensaries of 1696.

"That this unjust and innovating usurpation of the Druggists, together with the intrusion of uneducated and unskilful persons into professional practice, called loudly for some speedy and effective act, which should at once destroy the obtrusions complained of, and restore credit and respectability to the profession."

"If we regard personal views, it was stated to be a fact, the proof of which was in the tables of calculation then present, that were the aggregate sums obtained by this infringment of the Druggists, and divided amongst the Druggists of this metropolis, (a body of men unknown to the world till about the end of the last century, unauthorized by any public charter, and almost undefined by any public act,) were these sums equally divided, as they ought to be divided, amongst the Apothecaries of the metropolis, every

one would have an addition of nearly £200 a year to his present income. But this evil it appeared was not confined to the capital; it was declared to be a morbific infection, that it began at the capital as a central point, but diffused its deadly breath from thence to all the cities and towns throughout the kingdom. Nor stopped the contagion here. From the larger cities and towns it was beheld propagating itself to the smaller cities and towns, till at length, so general was the disease, there was scarcely to be found a village or hamlet without a village or hamlet druggist. If the sale of medicines and giving of advice was not here sufficient to support the vender, he added to his own occupation, the sale of mops, brooms, bacon, butter, and a thousand such articles besides."

A committee of twenty was appointed, funds subscribed, a general correspondence entered into with various parts of the country, and a vast mass of facts collected bearing on the condition of the druggists; a petition to Parliament followed, but nothing issued from that authority bearing on the druggists and chemists. In fact the effects were beneficial, as it induced a community of interest and prepared the way for a strongly manifested opposition to subsequent attempts by the apothecaries and physicians.

In 1813, the Association of Apothecaries caused a bill to be introduced into Parliament, containing several clauses extremely objectionable to chemists and druggists. A general meeting of the latter was held on March 4th, 1813, to consider the best means of opposition. A committee was appointed of some of the most talented of their number, of which the late William Allen was chairman, which acted in the most energetic manner. Funds were collected, the members in other cities corresponded with, petitions presented, &c., which was so effective in its results, as to cause the withdrawal of the offensive clauses, and thus gained the object of their appointment. The excess of funds thus sub-

scribed were placed in the hands of trustees, and continued to accumulate until the formation of the present Pharmaceutical Society, into whose treasury it was transferred with the consent of the surviving subscribers—by William Allen the only trustee then living.

We have now followed our author pretty closely in his "Historical Sketch," until it arrives at the present order of things in England. We have seen the apothecaries exfoliate from the physicians, become a separate class and rise into an influential body. Subsequently the chemists and druggists owed their origin to the same medical body, through the dispensaries, and have now outgrown in influence the apothecaries, in opposition to whom they originally arose. To continue the subject by describing the events immediately anterior to the formation of the Pharmaceutical Society, together with the interesting circumstances that contributed to its birth and growth, seems naturally to follow, but the already extended limits of this notice admonishes us to conclude it, which we now do with the promise of a continuation of the subject at a future time.

W. P., Jr.

LVII.—CHEMICAL TECHNOLOGY, OR CHEMISTRY APPLIED TO THE ARTS AND MANUFACTURES. By Dr. F. KNAPP, Professor at the University of Giessen. Translated and Edited, with numerous notes and additions, by Dr. EDMOND RONALDS, Lecturer on Chemistry at the Middlesex Hospital, and Dr. THOMAS RICHARDSON, of New Castle-on-Tyne. First American Edition, with notes and additions by Prof. WALTER R. JOHNSON, of Philadelphia. Vol. 1. Illuminated, with 214 engravings on wood. Philadelphia: Lea & Blanchard, 1848. pp. 504.

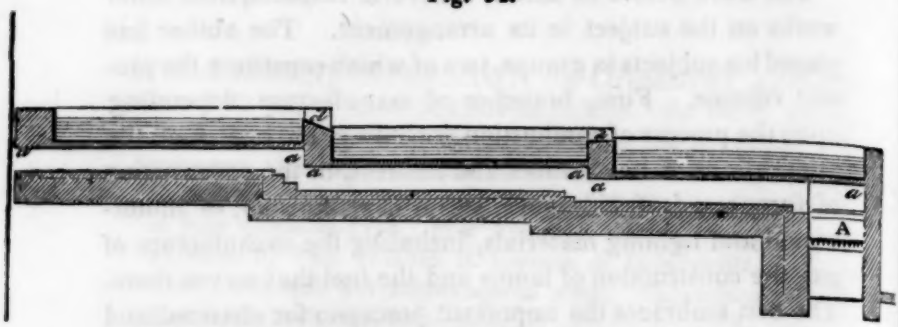
THE application of correct scientific principles to the processes of manufacturing is one of the noblest functions of the student of abstract science, because his labours have a direct bearing in improving the facilities of life in large communities. By the deductions of such a mind, a hitherto worthless product, or even noxious residue, is turned into a valuable agent in the economy of society, and the mass are doubly benefitted. For a long period, the *modus operandi* of most kinds of manufacture was kept secret, or at least no works were generally accessible which would enable the unitiated to enter into their pursuit. No journals for the promotion of the mechanic and scientific arts were known (as now conducted) for a long period, and the mysteries of the manufactory were preserved with the most jealous watchfulness, both on the part of principals and subordinates. Whilst this disposition continued, slow progress was made in the steps towards perfection.

Things have changed now, and manufacturers depend more on patents and the influence of large capital, well knowing that the cheaper an article of general consumption can be fabricated, the larger will be the demand. It is with pleasure, therefore, that we announce the republication here of the experience of Europe, especially when under the superintendence of capable men.

The work before us differs, in several respects, from other works on the subject in its arrangement. The author has placed his subjects in groups, two of which constitute the present volume. First, branches of manufacture depending upon the process of combustion, including, 1st, heat, fuel, the applications of heat, direct and indirect, in the construction of furnaces, draft chimneys, steam heat, &c; 2d, of illumination and lighting materials, including the manufacture of gas, the construction of lamps and the fuel that serves them. The first embraces the important processes for charcoal and coke; the second, the mode of extracting various fatty substances, used in illumination, as stearine, stearic acid, wax, the fixed oils, &c., &c. The chapters on gas manufacture are particularly well illustrated with cuts, exhibiting the various steps of the process. The old adage of "a penny saved is two pence gained," applies in large manufactures, as in the daily routine of domestic life, and whilst we repudiate niggardliness equally in either case, we rejoice at the application of a wise economy in both.

The second group, consisting of processes concerned in the production and application of the alkalies and earths, is much more extensive than would be at first imagined, as it embraces a number of collateral and resulting branches, and is that part most interesting to the pharmaceutist. The important bearing that sulphuric acid has in so many processes, has caused it to be treated of in this connection in the extraction of sulphur from its natural sources; the production of sulphuric acid, with the *modus operandi* of the lead chambers; the concentration of the acid, &c. We append a specimen of the illustrations exhibiting the expensive platinum arrangement for concentrating the acid from sp. gr. 1.7 to 1.84, together with the refrigerating syphon.

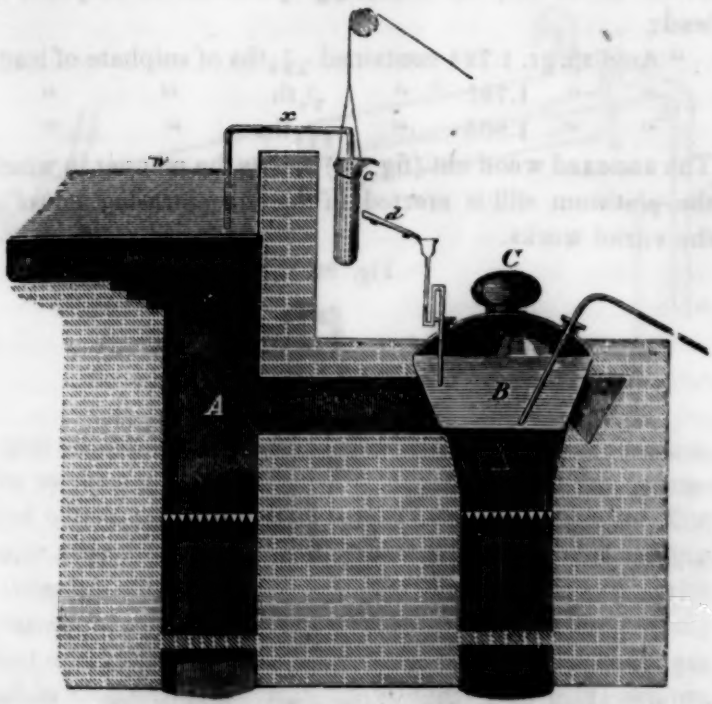
Fig. 94.



"The concentrating apparatus in which this separation [of water] is effected, consists of leaden pans and a platinum retort. The former, fig. 94, are erected over a fire, A, and supported by iron plates, *a a*, against which the flame beats; *d d* are incisions, through which the lower pans are filled. The evaporation precipitates a little sulphate of lead and oxide of iron, (anhydrous,) whilst the boiling point of the fluid attains a height at 65 per cent. of hydrate which endangers the pans, from the great heat, and causes a useless loss of acid by evaporation. When, therefore, about 11 per cent. of water has been evaporated, with which nitric oxide, nitric and sulphurous acids pass off, the acid is conveyed (having a specific gravity of 1.7) through the syphon *x* into the platinum retort, fig. 95, the fire under which is closely approximated to the fire of the pans A. The syphon *x*, which is here represented as closed, is worked without a stop-cock by the vessel *c*, on filling the retort in a remarkably simple and ingenious manner. When this vessel is lowered with its spout to the gutter *d*, the outer limb of the syphon, which is constantly full, becomes lengthened below *n*, and acid consequently flows out.

"The danger and great loss by breakage attending the use of glass vessels, have induced the manufacturers very generally — notwithstanding the great cost — to make use of platinum retorts. These are made (nearly all in Paris) to contain from five to twenty cwts., and cost from 8,000 to

Fig. 95.



12,000 dollars; all the joints in the retorts are soldered with gold. During the boiling, the contents of the retort separate into commercial acid and some acid water, which is conducted by the tube in the capital, and its spiral leaden continuation to one of the pans, where it is used to concentrate a quantity of weak acid from the chamber. If the heat were further increased, the boiling point would suddenly rise to 326° C. (619 F.,) and hydrated sulphuric acid would distil over, which, of course, is not desirable.

"With reference to the quantity of lead taken up by sulphuric acid in different states of concentration, experiments have lately been instituted by Anthon, which prove how very objectionable the practice must be of concentrating the acid in leaden pans beyond the prescribed limits. Anthon found in acid thus concentrated, and afterwards cooled

down to 65° F., the following quantities of sulphate of lead:

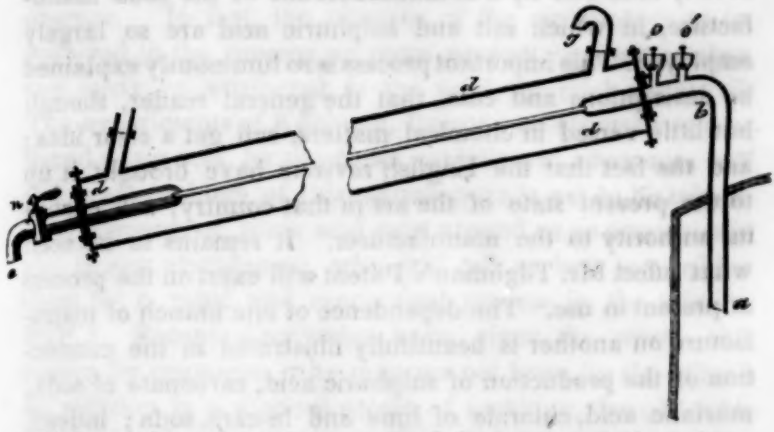
"Acid sp. gr. 1.724 contained $\frac{1}{4\,8\,0}$ths of sulphate of lead.
" " 1.791 " $\frac{1}{8\,0}$th " "
" " 1.805 " $\frac{7}{3\,2\,0}$ths " "

The annexed wood cut (fig. 96) shows the manner in which the platinum still is erected in the concentrating house of the vitriol works.

Fig. 96.

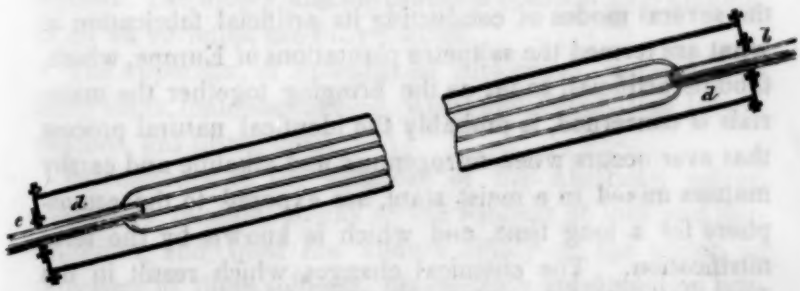
"The high price of platinum vessels renders it very much to the interest of the manufacturer that they should be in constant use; yet it is impossible to draw off so powerful an acid at that temperature into the glass carboys in which it is sent out, and leaden coolers cannot be used. Hence arises the necessity of the platinum syphons, figs. 97 and 98,

Fig. 97.



which at the same time answer the purpose of coolers. The syphon *a b c* is let into a wide tube *d d*, which is supplied with a current of cold water [below] through *e*. The water after becoming warm, flows off at *g*. The cooling is therefore effected by surrounding the hot acid in *b c* with a current of cold water passing in an opposite direction, the effect of which is very much increased by making the longer limb in four distinct tubes, as in fig. 98. To fill the syphon

Fig. 98.



the cock *n* is stopped, and acid is poured first into *o*, and then into *ó* till it runs down into the retort through *b a*. When *o* and *ó* are now closed, and *n* opened, the syphon comes into play."

The extraction of common salt is next treated of, imme-

diately followed by a detailed account of the soda manufacture, in which salt and sulphuric acid are so largely employed. This important process is so luminously explained by descriptions and cuts, that the general reader, though but little versed in chemical matters, can get a clear idea; and the fact that the English revisers have brought it up to the present state of the art in that country, will ensure its authority to the manufacturer. It remains to be seen what effect Mr. Tilghman's Patent will exert on the process at present in use. The dependence of one branch of manufacture on another is beautifully illustrated in the connection of the production of sulphuric acid, carbonate of soda, muriatic acid, chloride of lime and bi-carb. soda; indeed, it is only by the consumption of the residues that these articles can be manufactured at such low rates. The production of potashes from all the commercial sources is fully dilated on, and their relative value to the manufacturer exposed. Boracic acid and borax next occurs, followed by the fullest history of the saltpetre production that we have met with in a work of this kind. The natural sources of this substance, from caves, as in our own country, and earthy deposits in the East, are exposed; and the several modes of conducting its artificial fabrication in what are termed the saltpetre plantations of Europe, which, though artificial, so far as the bringing together the materials is concerned, is probably the identical natural process that ever occurs when nitrogenous and alkaline and earthy matters mixed in a moist state, are exposed to the atmosphere for a long time, and which is known by the term nitrification. The chemical changes which result in the generation of nitric acid, appear to be, first, the conversion of nitrogen into ammonia, and the subsequent oxidation of this into nitric acid and water, by a sort of fermentative, (catalytic) action, which, though much has been done by

Kuhlman and others for a century past, is yet more or less obscure. In fact, the nitrogen of the air appears to be involved in the process, as more product is obtained than can fairly be attributed to the solid material employed. The experiments of Kuhlman, Dumas and others have produced nitric acid by the direct oxidation of ammonia; but the great problem of this manufacture is yet to be solved. The elements of nitric acid exist around us as atmospheric air, in any abundance: who will tell us how to combine them by a rapid and economical process in the relation NO^5? Recent discoveries have given the world this source for cyanogen, why may we not hope for the other? Its solution is a glorious object of ambition, fraught with immense advantages to mankind, and reward to the discoverer.

Connected with saltpetre, is the gunpowder and nitric acid manufacture, especially the former, which is extensively treated of. The second group concludes with the soap manufacture, which is one of those dependent on the alkalies, and of prime importance. The sources of fatty matter in the vegetable world are exposed, especially the palm oil; and the bleaching of oils preparatory to using them is described. The theory, and the practical points of soap making, in all its varieties, are fully noticed.

The appendix, of upwards of fifty pages, is devoted to lamp black, matches, cokeing, patent fuel, ventillation, lamps, candles, gas illumination.

In reference to the additions of the American editor, they have relation chiefly to the subjects of fuel and illumination, and from the known ability of the editor, in reference to these subjects, his opinions are doubtless possessed of much value. The mechanical execution of the work, especially the illustrations, is highly creditable to the American artist, and speaks favourably for the enterprize of the publishers.

W. P., Jr.

ART. LVIII.—A DISPENSATORY OR COMMENTARY ON THE PHARMACOPŒIAS OF GREAT BRITAIN AND THE UNITED STATES, COMPRISING THE NATURAL HISTORY, DESCRIPTION, CHEMISTRY, PHARMACY, ACTIONS, USES, AND DOSES OF THE ARTICLES OF THE MATERIA MEDICA. By ROBERT CHRISTISON, M. D., V. P. R. S. E., &c. Second edition, revised and improved: with a Supplement containing the most important new Remedies, with copious additions, and two hundred and thirteen illustrations. By R. EGLESFELD GRIFFITH, M. D., &c. 1 vol. 8vo. pp. 1008. Philadelphia: Lea & Blanchard, 1848.

THIS American reprint of the extensive work of the eminent Scotch pharmacologist, like its two congeners, treats copiously of the remedial agents embraced by the Materia Medica, and with the London and United States, constitutes the trio in the English language, designated as Dispensatories—now in full career of popularity. All three are professedly exponents of the several Pharmacopœias appertaining to the kingdom of Great Britain. The United States Dispensatory, however, has given prominence to our own authority, and made the others secondary, while in the original publications of London and Edinburgh, our standard is either altogether neglected, or but transiently referred to. The present edition of the work under consideration has the deficiency supplied by the labours of the editor.

We have always considered it extraordinary that, while three Pharmacopœias existed in Great Britain, and two of them possessed a peculiar advocate and exponent in the form of a Dispensatory, the remaining one, the Dublin, had not a corresponding accompaniment. Irish medical talent is certainly equal to the undertaking. In government, we are aware that English, Scotch and Irish policy, and

schemes of national advantage are widely different. This may be comprehended by reference to circumstances of a local character, and hereditary prejudices, and we are not disposed to discuss whether or no a moral difference exists, sufficient to give rise to modifications of law and equity: but that the disparity in physical traits is so decided as to call for a difference in the preparation of purgatives, diuretics, &c., appears to us an indubitable fallacy. One method of dosing might suffice for all, and the experiment ought at least to be tried, by framing a national British Pharmacopœia.

Christison's Dispensatory was first issued in 1842, and may be regarded as the successor to the New Edinburgh Dispensatory of Dr. Duncan—a work which began its career in the first year of the present century, and terminated with the eleventh edition, in 1826. This latter work also formed the basis of the American Dispensatory by Dr. Coxe, which commenced in 1806, and ended with the eighth edition, in 1840. The second edition of Dr. Christison's work, which is the one now published, has been enriched by such information as discovery in science has afforded within the past six years. It has been posted up to the present time, and thus again offered to the profession: in this country, with the additions of the American editor.

The first portion, termed the Introduction, is devoted to the processes of pharmacy. The principles of pharmacy are here succinctly laid down, and each form of exhibiting medicines clearly made known and discussed. Where chemical apparatus is required for the formation of particular preparations, a drawing of the utensil employed is frequently given. In this chapter, weights and measures are duly set forth and explained, and to it have been added by the editor, Dr. Griffith, a chapter on specific gravity, with ample tables of the density of various fluids and prepara-

tions; an exposition of thermometrical equivalents, with full tables exhibiting relations on the different scales, the effects of temperature, symbols, solubility of salts, and an explanation of terms used in prescriptions, from Gray's Supplement to the Pharmacopœias.

The Materia Medica proper commences in the usual way, the alphabetical arrangement being followed, which seems, time honoured, to be inseparable from a dispensatory. The information imparted under each head, is that found in the more recent treatises on the Materia Medica. Where articles are derived from the vegetable kingdom, the plants affording them are referred to their appropriate natural history, position, under classes and orders, but few botanical details are indulged in. Medical botany is of secondary consideration, and the author is no doubt impelled to this by the full instruction which Scotch students receive in that department, and the co-existence of the admirable treatise on the subject by Dr. Lindley. The account of drugs met with in the English market is clear and concise, and their chemical constitution correctly given, in accordance with the most recent analyses.

There are certain subjects to which Dr. Christison appears to have given especial attention; the chapters upon these are peculiarly rich with information. Conium is one of them, which by him has been experimented on. The test for the activity of this drug, which originated with the Edinburgh College, is invaluable, we mean that by liquor potassæ. Another of these is scammony. Dr. Christison's investigations into the purity of this drug, have presented the subject in its true light, and shown that the grossest impositions have been practised. Sophisticated scammony is most common in the English market, and by the author has been divided into three kinds, which are termed *calcareous*, *amylaceous*, and *calc-amylaceous*. The worst of the specimens contained by analysis 42.4 per centum of resin.

Bad as these may be, they must be decidedly active when compared with the stuff designated as scammony, and sold as of *first quality* in the United States. One lot, which was extensively distributed, and which during the past year fell under our observation, contained but 6 per cent. of resin; the basis of it was gum tragacanth. The moral sense of the drug community must either be greatly depraved, or else extreme ignorance prevails in it, to tolerate such imposition. The recent act of Congress with regard to adulterated and spurious articles, will, we hope, aid and facilitate the exposure of all such imposition.

For the chemical examination of articles employed in medicine, we are indebted to European, and more especially to continental experimenters. The rich reward of fame is justly due the chemists who have zealously and indefatigably laboured in this field of research; a few laurels, however, might be awarded those who in this country have manifested a similar spirit, and really have contributed their quota to the progress of analysis. We are prompted to this reflection from the examination of the article on Lobelia, in which not one word is mentioned of the researches of Mr. Procter, although he, at least ten years back, satisfactorily isolated the principle upon which the activity of the drug depends, and by a continued series of experiments since, has studied its character and properties. His papers are published in the American Journal of Pharmacy. We might excuse Dr. Christison for such omission, but in the reprint justice should have prompted, as well as policy suggested, the completion of the chemical history.

Upon turning over the pages some slight errors are observable, as for instance, in attributing the Tahiti arrowroot to Tacca pinnatifida. Mr. Nuttall, several years ago, described the plant affording Sandwich Island arrowroot, and gave to it the name of *T. oceanica*, because so widely dif-

fering from the Asiatic species as to constitute a different one.

The Dispensatory issued on this side the Atlantic, differs from the original Edinburgh edition in the addition of numerous illustrations, which, with the specification of the processes of the United States Pharmacopœia, its nomenclature, and an account of indigenous products, constitute the labours of the editor. The book, then, is replete with valuable information; it is one of the standards of the day; and as such, must meet with the favour it deserves.

J. C.

ART. LIX.—LAW IN REFERENCE TO ADULTERATED DRUGS.

An Act to prevent the importation of adulterated and spurious Drugs and Medicines, approved 26th June, 1848.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That from and after the passage of this act, all drugs, medicines, medicinal preparations, including medicinal essential oils, and chemical preparations used wholly or in part as medicine, imported into the United States from abroad, shall, before passing the Custom House, be examined and appraised, as well in reference to their quality, purity, and fitness for medical purposes, as to their value and identity specified in the invoice.

Sec. 2 *And be it further enacted,* That all medicinal preparations, whether chemical or otherwise, usually im-

ported with the name of the manufacturer, shall have the true name of the manufacturer, and the place where they are prepared permanently and legibly affixed to each parcel by stamp, label or otherwise; and all medicinal preparations imported without such names affixed as aforesaid, shall be adjudged to be forfeited.

SEC. 3. *And be it further enacted,* That if on examination any drugs, medicines, medicinal preparations, whether chemical or otherwise, including medicinal essential oils, are found in the opinion of the examiner to be so far adulterated or in any manner deteriorated, as to render them inferior in strength and purity to the standard established by the United States, Edinburgh, London, French and German pharmacopœias and dispensatories, and thereby improper, unsafe, or dangerous to be used for medicinal purposes, a return to that effect shall be made upon the invoice, and the articles so noted shall not pass the Custom House, unless on a re-examination of a strictly analytical character, called for by the owners or consignees, the return of the examiner shall be found erroneous, and it shall be declared as the result of such analysis, that the said articles may properly, safely, and without danger, be used for medicinal purposes.

SEC. 4. *And be it further enacted,* That the owner or consignee, shall at all times, when dissatisfied with the examiner's return, have the privilege of calling, at his own expense, for a re-examination, and on depositing with the Collector such sum as the latter may deem sufficient to defray such expense, it shall be the duty of that officer to procure some competent analytical chemist possessing the confidence of the medical profession, as well as of the colleges of medicine and pharmacy, if any such institutions exist in the State in which the Collection District is situated, [who shall make] a careful analysis of the articles included in said return, and a report upon the same under oath, and

in case the report, which shall be final, shall declare the return of the examiner to be erroneous, and the said articles to be of the requisite strength and purity, according to the standards referred to in the next preceding sections of this act, the entire invoice shall be passed without reservation on payment of the customary duties; but in case the examiner's return shall be sustained by the analysis and report, the said articles shall remain in charge of the Collector, and the owner or consignee, on payment of the charges of storage, and other expenses necessarily incurred by the United States, and on giving a bond with sureties satisfactory to the Collector to land said articles out of the limits of the United States, shall have the privilege of re-exporting them at any time within the period of six months after the report of the analysis; but if the said articles shall not be sent out of the United States, within the time specified, it shall be the duty of the Collector, at the expiration of the said time, to cause the same to be destroyed, holding the owner or consignee responsible to the United States for the payment of all charges, in the same manner as if said articles had been re-exported.

SEC. 5. *And be it further enacted*, That, in order to carry into effect the provisions of this act, the Secretary of the Treasury is hereby authorized and required to appoint suitably qualified persons as special examiners of drugs, medicines, chemicals, &c., namely: one examiner in each of the ports of New York, Boston, Philadelphia, Baltimore, Charleston and New Orleans, with the following salaries, viz: at New York sixteen hundred dollars per annum, and at each of the other ports above named one thousand dollars per annum, which said salaries shall be paid each year quarterly, out of any moneys in the Treasury not otherwise appropriated; and it shall be the duty of the said Secretary to give such instructions to the Collectors of the Customs in the other Collection Districts, as he may deem

necessary to prevent the importation of adulterated and spurious drugs and medicines.

SEC. 6. *And be it further enacted*, That the special examiners to be appointed under this act, shall, before entering on the discharge of their duties, take and subscribe the oath or affirmation required by the ninth section of the act of the thirtieth of July, eighteen hundred and forty-six, entitled "An Act reducing the duty on imports and for other purposes."

SEC. 7. *And be it further enacted*, That the special examiners authorized to be appointed by the fifth section of this act, shall, if suitably qualified persons can be found, be taken from the officers now employed in the respective Collection Districts, and if new appointments shall be necessary, for want of such persons, then, as soon as it can be done consistently with the efficiency of the service, the officers in said districts shall be reduced so that the present number of said officers shall not be permanently increased by reason of such new appointments.

DEPARTMENT OF STATE, June 28, 1848.

The above is a true copy as compared with the original Roll. (Signed) W. S. DERRICK, A. C. C.

—

Circular instructions to collectors and other officers of the Customs.

TREASURY DEPARTMENT, July 8, 1848.

The attention of Collectors and other officers of the Customs is specially called to the provisions of the annexed act of Congress, entitled, "An Act to prevent the importation of adulterated and spurious drugs and medicines," approved 26th June, 1848.

Upon entry of any "medicinal preparations, whether chemical or otherwise, *usually* imported with the name of the manufacturer, and the place where prepared, perma-

nently and legibly affixed to each parcel," careful inspection and examination must be made by the United States appraisers to see that the true name of the manufacturer, and also the place where said articles were prepared, are 'legibly affixed to each parcel by stamp, label, or otherwise," as required by the *second* section of the act. In default of these requisites the Collector will immediately report the case with all the facts to the United States District Attorney in order that he may institute the necessary legal proceedings to obtain a decree of condemnation and forfeiture of the articles in pursuance of the act. When a decree of condemnation and forfeiture, for the causes before stated, takes place, an immediate examination of the articles in the manner indicated in the *third* section of the act, must be had to ascertain whether all or any of the articles contained in the importation possess the standard of strength and purity therein required. If any articles do not agree with these standards, they cannot be sold, like other forfeited goods, as it would defeat the object of the law thus to throw upon the community adulterated and spurious drugs and medicines. Such portion of the importation as may prove to possess the proper standard of strength and purity may be immediately sold and the proceeds accounted for as in ordinary cases of forfeiture. But the adulterated and spurious articles contained in the importation must be destroyed in the manner hereinafter mentioned.

It will be observed on reference to the third section of the act that all imported "drugs, medicines and medicinal preparations," &c.," are to be tested in reference to strength and purity by the standards established by the "United States, Edinburgh, London, French, and German pharmacopœias and dispensatories." It is not conceived to be the intention of the law that the articles referred to should conform in strength and purity to each and all of those standards, as such conformity is believed to be impracticable wing to the variations in those standards. If, therefore,

the articles in question be manufactured, produced or prepared in England, Scotland, France or Germany, as the case may be, and prove to conform in strength and purity to the pharmacopœia and dispensatory of the country of their origin, said articles become exempt from the penalties of the law. All articles of the kind mentioned, produced, manufactured or prepared in any other country than those before mentioned, must conform in the qualities stated to the United States pharmacopœia and dispensatory.

In case of appeal from the report of the special Examiner as provided for in the fourth section of the act, the Collector will exercise proper judgment and discretion in the selection of an analytical chemist possessing the qualifications and standing required by the act, to make the prescribed analysis, previously taking from the owner or consignee a sufficient deposite of money to defray the expenses of the analysis, and when completed, returning to the owner or consignee any excess of money thus deposited.

Upon application to export any adulterated and spurious articles in pursuance of the fourth section, proper bond and security must be taken for the exportation and production of proof of landing abroad, as in the case of exportation of goods for benefit of drawback, or from public warehouse.

It will be perceived that the fifth section provides for the appointment at certain designated principal ports of special Examiners of "drugs, medicines, chemicals, &c.," and makes it the duty of the Secretary of the Treasury "to give such instructions to the Collectors of the Customs in the other collection districts as he may deem necessary to prevent the importation of adulterated and spurious drugs and medicines."

When, therefore, importations of drugs, medicines, chemicals, &c., take place at any port of entry other than those enumerated in the fifth section of the act, the Collector of the Port will appoint, in pursuance of the 16th sec-

tion of the act of 1st March, 1823, to be compensated at a per diem rate of five dollars when employed, some respectable person deemed by the Collector to possess suitable knowledge and qualifications to make examination and report on the value and quality of the articles according to the standards prescribed by the act. In case of dissatisfaction, and appeal taken by the owner or consignee from said Examiner's report, the same course in respect to analysis and the expenses and proceedings connected therewith as required at the principal ports, will be pursued. In case a suitably qualified person to act as special Examiner cannot be found at the port or convenient thereto; or when analysis is called for, a properly qualified analytical chemist cannot be conveniently obtained at said port, the Collector will immediately so advise the Department in order that a special Examiner or analytical chemist, according to the circumstances, may be detailed from one of the principal ports to make the examination or analysis at the port of arrival.

The reports of the special Examiners, as also the analysis of the analytical chemists, must be made in writing and signed by them respectively and filed in the Custom House. Whenever any articles are to be destroyed, as required by the fourth section of the act, they must be conveyed to some suitable place, and proper means, to be prescribed by the special Examiner or Analyst, be used for their safe and effectual destruction, and executed in the presence of an officer of the Customs detailed by the Collector for the purpose. Before destruction of the articles a particular description or statement of the same must be prepared, containing the name of the importer or owner, the date of importation, the name of the vessel and the place from whence imported, with the character and quantity of the articles and the invoice value. The fact of their having been destroyed must be certified on said statement by the officer detailed for the purpose. These statements must be file

in the Custom House and returns prepared therefrom must be rendered quarterly to the Department.

Before the special Examiners appointed under this act can enter on the discharge of their duties, the following oath or affirmation, to be administered by the Collector, must be taken and subscribed by them, viz:

I, A. B., having been appointed by the Secretary of the Treasury special Examiner of Drugs, Medicines, Chemicals, &c., within and for the port and district of ———, do solemnly, sincerely, and truly swear (or affirm) that I will diligently and faithfully perform the duties of said office as prescribed by the act to prevent the importation of adulterated and spurious drugs and medicines, approved 26th June, 1848, and will use my best endeavors to prevent and detect frauds upon the revenue of the United States. I further swear (or affirm) that I will support the Constitution of the United States.

Signed, A. B.

Sworn (or affirmed) before me this —— day of ———, A. D., 184 . C. D., *Collector.*

These oaths or affirmations must be forwarded for file in the department. R. J. WALKER,

Secretary of the Treasury.

Adulteration of Medicines.

At a special meeting of the College of Pharmacy of the City of New York, held on Thursday evening, July 6th 1848, the following Preamble and Resolutions were unanimously adopted:

Whereas: upon the application of the College of Pharmacy of the City of New York to the Congress of the United States at its present session, seconded with one accord by the Medical and Pharmaceutical Institutions throughout

the country, by the late National Medical Convention, by Physicians and Apothecaries, and sound-hearted men of all parties, with almost unprecedented unanimity, a law has been enacted and signed by the President on the 26th June, 1848, entitled, "An act to prevent the importation of adulterated and spurious drugs and medicines;" which, in our belief, is calculated to arrest the criminal traffic in spurious and adulterated drugs and chemical preparations intended for medical use, so far, at least, as relates to their importation from abroad, (which, to the honor of our own country, we believe has hitherto been the chief source of this detestable species of fraud;) and whereas, it becomes our duty from time to time, as occasion presents, to adopt such measures as we may find expedient to carry out one of the prominent objects of our Institution, viz. "to guard against abuses in the preparation and sale of Medicines," therefore

Resolved, That we will, collectively and individually, give our earnest aid to make this salutary law effective in all its parts.

Resolved, That in our judgment, cheating in Medicine is a great moral—and ought to be legal—felony, compared with which, the counterfeiting of bank notes and coin are venial offences.

Resolved, That we will collectively and individually take all proper measures to expose publicly, and discountenance in every manner, all persons in this country who may be detected in the base crime of adulterating and sophisticating articles and preparations intended to be sold as medicines, and that we will report them particularly to all Colleges of Pharmacy and Medical Institutions with which we correspond.

Resolved, That should any of our own members be guilty of such acts, we recommend the prompt application of the seventh section of the third article of the By-Laws of the College, which is as follows:

"Complaints may be preferred against any member of the College, to the Board of Trustees, for misconduct in his business, either by the adulteration of articles or otherwise. If the Trustees are satisfied that such complaints are well founded, they shall appoint a sub-committee to remonstrate with the individual, and if he shall refuse or neglect to remedy the evil complained of, the Trustees, may report the case to a meeting of the College, to be called by the President at their request, giving the offending member due notice thereof, and at such meeting he may be expelled, by a vote of three fourths of the members present."

Resolved, That copies of the foregoing preamble and resolutions be presented to each of the Colleges of Pharmacy and of medicine in the United States, that they be published in the newspapers at the discretion of the President and Secretary, and that copies of them be offered for publication to the journals of Pharmacy and Medicine in this country, and to "The Pharmaceutical Times and Journal of Chemistry," and "The Pharmaceutical Journal and Transactions" in London, and the "Journal de Pharmacie" in Paris.

By order of the College:

WILLIAM H. MILNOR, *Secretary*.

ART. LX.—ON THE EMPLOYMENT OF THE TARTRATE OF POTASSA AND MAGNESIA, AND THE ACETATE OF MAGNESIA AS PURGATIVES.

THE *Journal de Pharmacie* for April, 1848, contains a long report on the above subject, by MM. Guerard and Garot, on two communications sent to the Society of Pharmacy, at Paris, by M. Maillier and M. Renault.

The former proposes the salt obtained by saturating cream of tartar in solution with ordinary carbonate of magnesia, under the name of Tartrate of Potassa and Magnesia, in the form of a solution like that of the citrate. 30 parts of cream of tartar, 8½ parts of carbonate of magnesia, and 700 parts of boiling water, are heated together till a solution is formed, which is aromatized and sweetened.

The reporters observe that they repeated the formula according to the conditions indicated, and obtained a limpid liquid, having a decidedly saline taste, which is like that of the neutral tartrate of potassa, and it is only owing to the large amount of water of dilution that it is diminished in disagreeableness compared with other vegetable salts.

They find that the borotartrate of potassa, (the soluble cream of tartar of the French,) when similarly treated, yields a much more tasteless solution, and propose the following formula:

Soluble cream of tartar, of the Codex . .	1.00
Carbonate of magnesia . . .	.24
Water	6.00

The soluble cream of tartar is dissolved in the water in a silver basin saturated with magnesia, and evaporated carefully till the liquid was reduced to a tenacious paste, which is divided into little masses, and dried in a stove.

It presents the form of greyish-white masses, uniform un-

crystalline fracture, is slightly elastic under the pestle, but easily reduced to powder. It is readily soluble in 8 or 10 parts of warm water, with the addition of a little lemon juice. The following formula for its administration is suggested, viz:

Borotartrate of potassa and magnesia	30	parts.
Citric acid	2	"
Aromatized syrup of lemons	60	"
Warm water	300	"

If the proportion of salt is increased, or that of the water diminished, the solution is less complete.

Mr. Renault, of Paris, who suggests the use of the acetate of magnesia, gives the following formula for its preparation, viz.: Dissolve 120 parts of carbonate of magnesia in a sufficient quantity of acetic acid and evaporate till the whole weighs 300 parts. In this state it is a syrupy liquid, which has, weight for weight, the same magnesian strength as the sulphate of that base.

M. Renault proposes that one ounce of this solution (by weight) be mixed with three ounces of syrup of oranges, to constitute the weaker, and one ounce and a half of the solution to three ounces of syrup for the stronger solution.

The great deliquescence of the salt prevents its being kept *per se*, whilst its extreme solubility in alcohol as well as water, enables it to be used in tinctures, elixirs, &c., as well as in watery solutions.

The reporters conclude by stating, that the salts in question possess decided purgative properties, though like all the salts of a similar character already employed, are not constant in their effects: that their taste is easily masked so as not to be repugnant to the sick, and that they may be advantageously introduced into therapeutics.

ART. LXI.—STILLINGIA SYLVATICA, OR QUEEN'S DELIGHT.

By H. R. Frost, M. D., of Charleston, S. C.

Although it is probable, that the materia medica is already sufficiently ample to enable us to contend with the various diseases of life, and the improvements we should aim at, would be, rather an increase of pathological knowledge, and a more improved application of the means we already possess: yet when an article is brought before us with such strong claims to our attention, from the experiments which have been made with it, and from the effects produced, I cannot, with any propriety, refuse its admission amongst our numerous means of curing diseases. We are too much disposed to be led away by novelty, and to adopt among our curative agents, many articles which have little else to recommend them; but of the present article, we may think more favourably, as it has been in use many years, and reports of its effects still reach our ears from legitimate and illegitimate sources.

Description of the Plant.

Class—Monæcia Monadelphia.—*Linn.*

Natural order—Euphorbiaceæ.

Root—large, woody, perennial.

Stem—herbaceous, two to three feet high, somewhat angled by the base of the leaves, with the whole plant glabrous and lactescent.

Leaves—alternate, irregularly serrulate, somewhat coriaceous, shining on the upper face, paler underneath.

Flowers—in a terminal spike, the upper crowded as in an ament, sterile, with interposing cupulate glands.

Fertile florets, few at base.

Grows in dry sandy soils, and flowers in May and June.

The part employed is the root, which acquires a considerable size, and runs to a great depth in the earth. Its structure is not very fibrous, and it is easily broken in gathering. It grew in considerable quantities in the neighbourhood of this city, but has been nearly exterminated by the frequent searches made for it. It is found in considerable abundance in this State, particularly in Edgefield, Barnwell, Newberry, and Abbeville Districts. It is also found in Georgia and other parts of the Union.

The medicinal properties of this plant are nowhere particularly spoken of, and for a long time a knowledge of them was confined to irregular practitioners, and to others in the inferior stations of life. The reputation it had acquired in the hands of these persons, rendered it an object of attention to others more informed, and experiments which have been made, confirm, in some degree, the opinions which were entertained of its efficacy, and its title to be arranged among the active articles of the materia medica. Few vegetable productions, in their recent state, exhibit more power, concentrated in a small compass, or exercise an influence more energetic upon the particular organs to which it is applied, and through them to the system generally. So powerfully is this action exerted upon the capillary and secreting vessels, in changing their morbid states or conditions, and thereby disposing to a new and more healthy action, that in this respect it is nearly allied to mercury, exerting an influence little inferior, in many cases, and in others greatly to be preferred. The great object to be kept in view in the treatment of many diseases, is, to direct our remedies in such a manner as to restore healthy actions, by slowly operating upon the secretions. It is the power which mercury possesses to change the action of these vessels, which renders it so valuable an agent, and, in my opinion, the Stillingia is not very far its inferior. The operation of this article extends further—

it exerts an influence upon the lymphatic vessels which mercury cannot equal, and is therefore an important medicine in its diseases.

Sensible Properties.

If we open a drawer in which the recent root has been kept a short time, we are sensible of an odour, extremely strong and acrimonious, and rather of a disagreeable character.

The taste of this root is also pungent, and leaves on the root of the tongue and fauces an impression biting and irritating, exciting a flow of saliva.

The juice of the root, applied to the surface, and rubbed upon it, occasions smarting and irritation. If we remain in a close room where the root is being boiled, and the vapour passes into the room, a sense of sickness at the stomach is excited, with a disposition to discharge saliva, with headache and other unpleasant symptoms. From this circumstance, I infer that the active matter is of a volatile nature, and it is proved, by the roots losing much of their weight and activity by being long kept. It is estimated that the probable loss is 80—100 per cent.

From the above we recognize, that the plant will present a close alliance to the most active of the euphorbiaceæ. In its irritating operation upon the surface, not much inferior to the oil of the Croton tiglium; and in its emetic and cathartic operation, superior to the Euphorbia ipecacuanha, and E. corollata. From its alliance with these plants, its activity might be inferred, and this has been fully verified by experiment.—*Southern Journ. Med. and Pharm. Nov.* 1846.

[Dr. Frost's paper extends to the medical relations and pharmaceutical treatment of the Stillingia, from which we condense the following.

It possesses considerable emetic power, especially in the

recent state, and is resorted to for this purpose by country residents. A single slice of the recent root, not larger than a sixpence, chewed and swallowed, will sometimes produce vomiting, and is attended with much heat, and nausea; and with increased flow of saliva. These properties are to a great extent lost by drying.

Dr. F. infers from its strongly stimulating action on the stomach in large doses, that other parts of the system can be beneficially influenced through a *stimulant and alterative operation*, and states that it has been resorted to in diseased conditions of the capillary and lymphatic systems. For at least thirty years it has had a reputation, chiefly amongst unprofessional persons, especially in scrofulous and venereal diseases, in the form of infusion and pills.

Dr. F. considers that its reputation in scrofula is well established by competent testimony. It has been employed where the glands of the neck were enlarged, where suppuration has taken place, and in ulcerations of the same; and found beneficial. Its use is required to be continued for a length of time; and it is an object of some importance to have it in the most eligible form for administration. The plan which has been found most efficacious and agreeable, is to mix the recent juice with thick treacle, which preserves it and masks its pungency. The dose to be regulated by the effects.

It is in chronic diseases and chronic inflammations, however, that its effects are best seen, and more particularly in secondary syphilis, of which disease Dr. F. details a case treated by his friend, Dr. T. Y. Simons, with considerable success, by a simple decoction of four ounces of the recent root in a pint of water, daily for several months.

Dr. Frost prefers to employ the Stillingia in combination with other alteratives, as sarsaparilla, and guaiacum; and thinks its powers are increased and favourably modified.

℞.		
	Stillingia root, recent,	℥iv.
	Sarsaparilla root, bruised,	*lb*.ss.
	Guaiacum wood, rasped,	*lb*.ss.
	Sassafras root,	℥iv.
	Water,	1 gallon.

They are boiled in a covered vessel till sufficiently extracted, strained and reduced to two quarts, and sugar or treacle added to make a syrup by simmering.

This crude mode of preparation proved less advantageous than when a saturated tincture of the Stillingia was added to a syrup of the other ingredients in the rates of a pint to the gallon.

The dose of this syrup varies from ℥ss, to ℥j. three or four times a day.

Dr. Frost states that the bichloride of mercury and iodide of potassium may sometimes be associated with great advantage.

Dr. F. recommends this preparation of Stillingia in ulcerations of the palate, throat, and mucous membrane, of the nose, the skin and other parts. It will remove blotches, foul spots, and stains, &c., from the skin, and will be found useful in various cutaneous diseases.

Should this article prove of sufficient importance to attract general attention, its properties may be extracted and prepared according to a more enlightened method than that above stated; viz., by means of diluted alcohol in the present method of extracting sarsaparilla for extract or compound syrup.]

ART. LXII.—ON EMULSIONS OF CASTOR OIL.

By A. Manne, Pharmacien, Paris.

To M. Chevallier,

Sir,—Having frequently to make emulsions of Castor oil, either by prescription of physicians, or at the demand of my customers, making them in fact four or five times a day, I found myself in a position to make researches relative to the best means of administering this medicine. * * * I have employed gum arabic in different proportions, but have obtained emulsions either too thick or imperfectly made. The yolk of egg has offered me an excellent emulsion, but one yolk is required for every ounce and a half of oil. Is it not possible that the yolk of egg injures the purgative effects of the oil by its nutritive properties? does it not render the purgative heavier and less supportable by the stomach? These doubtful points lead me to doubt the utility of yolk of egg, and determined other attempts at finding a means of making a homogeneous emulsion, agreeable to the sight and more supportable by the stomach. To accomplish this I have had recourse to gum tragacanth, and the following formula has given the most satisfactory results.

Formula for Purgative Emulsion of Castor Oil.

℞.		
	Castor oil,	11 drams.
	Powdered tragacanth,	½ dram.
	White sugar,	75 grains.
	Water,	2½ fluid ounces.
	Syrup of orange flowers,	6 fluid drams.

Mix and make an emulsion as follows:

Triturate the tragacanth with the sugar, then add the syrup and agitate rapidly in a mortar until the mucilage

begins to thicken a little, I then add the oil and continue to triturate until the mixture is homogeneous, and add the water little by little during the trituration. In this manner I have obtained an emulsion of castor oil which leaves nothing to desire, and which will remain eight or ten days without an atom of oil separating.—*Jour. de Chimie Medicale.*

ART. LXIII.—ON THE EMPLOYMENT OF THE AIR BLADDERS OF FISH FOR ADMINISTERING COD'S LIVER OIL.

I HAVE employed with this object, the bladders of our river fish, such as gudgeons, *ablettes,* and perch. They replace with advantage the pharmaceutical capsules, which are difficult to prepare, expensive, and of less capacity. These vesicles being in most instances separated into two cells by a contraction or partition, they can be easily divided in this place by a cut of the scissors. The oil is introduced into the resulting opening by means of a little syringe of glass, which orifice is afterwards closed by means of a thread of silk, applied in a slip knot around the part entered by the syringe, which is then drawn tightly as soon as the syringe is withdrawn, and tied in a double knot. One-sixth, one-fifth, one-fourth, or one-third of an ounce of the oil may be thus taken at a dose, without the patient perceiving the taste or odour.

To render the employment of these new natural capsules more agreeable, they can be sprinkled with sugar.

These vesicles have a further advantage, that of being preserved in spirit of wine or gin, so as to be filled with oil as the demand requires.—DE RUDDER.—*Jour. de Chim. Medicale.*

ART. LXIV.—ON THE DISCOVERY OF A NEW ORGANIC BASE IN OPIUM.

By Dr. G. Merck.

Opium appears to continue an inexhaustible source of new substances, and especially of such as possess basic properties. Up to the present time five such bodies have been prepared from opium, and satisfactorily proved to be distinct; and I have now succeeded in discovering a new base in the residues from the preparation of morphium, which I shall call *papaverine*. I shall at present merely establish the peculiarity and formula of this body, and shall on a future occasion describe more fully its preparations, its reactions, and its medicinal properties, if it possess any.

The pure base separates from alcohol in confused aggregations of white acicular crystals, and from ether in somewhat larger needles. It is very sparingly soluble in cold, more soluble in boiling alcohol, from which it again separates in a crystalline state on cooling; it is likewise very sparingly soluble in cold ether, and is deposited in crystals from a boiling ethereal solution on cooling. It is insoluble in water. The solution scarcely turns red litmus-paper blue. When the crystals are moistened with concentrated sulphuric acid, they turn blue.

Papaverine forms with acids salts, the majority of which are very sparingly soluble in water, the muriate being especially characterized by the ease with which it crystallizes. The base dissolves readily in moderately concentrated muriatic acid; and on the addition of more acid, a white precipitate first separates, which collects into drops, and forms an insoluble oily layer at the bottom of the vessel. When left quiet, crystals form in the oily and likewise in the

supernatant aqueous liquid, which continue to increase for a long time until the entire mass of the oily liquid is converted into a tissue of well-defined crystals several lines in length. A gentle heat facilitates the crystallization. The oily liquid dissolves on boiling, and again separates for the greater part on cooling. When some crystals, freed by washing with water from adherent acid, are dissolved in water, the solution remains transparent on cooling, and only after several days' standing do large crystals separate; when, on the contrary, a little muriatic acid is added to the cold solution, the salt separates in the above-described form. The crystals of the muriate are very sparingly soluble in cold water; the solution has no action upon litmus-paper. The muriate of papaverine crystallizes in right rhombic prisms.

Sulphuric and nitric acids behave towards the base like muriatic acid, only the crystals could not be obtained of such large size.

With chloride of platinum the muriate of papaverine yields a yellow precipitate, which is insoluble in boiling water and in boiling alcohol, and which I could not obtain crystallized. The analysis of the base, of the muriate, and of the platinum salt led to the following formulæ:

Papaverine . .	$C^{40}\ H^{21}\ NO^{8}$.
Muriate . .	$C^{40}\ H^{21}\ NO^{8}\ ClH$.
Platinum salt . .	$C^{40}\ H^{21}\ NO^{8}\ ClH,\ PtCl^{2}$.

This new body is consequently distinct from the bases hitherto discovered in opium; and it is well characterized by its salts and their dissimilar oily and crystalline nature, which do not allow of its being mistaken for narcotine, to which the *pure* base has otherwise some resemblance.—*Chem. Gaz., from Liebig's Annalen.*

ART. LXV.—PREPARATION OF ANHYDROUS SULPHURIC ACID.

By Mr. H. Sugden Evans.

The process we find described in most chemical works, for the preparation of anhydrous sulphuric acid, consists in submitting Nordhausen oil of vitriol to distillation at a low temperature, with a suitable apparatus for condensing the white fumes which pass over. Owing, however, to the difficulty of procuring, in this country, good Nordhausen oil of vitriol, containing any appreciable quantity of the anhydrous acid, this process has failed in the hands of many who have tried it, and the substance under notice is generally looked upon as a rare chemical product. In its crystalline state, it is so beautiful an object, that many chemists would, no doubt, be anxious to add it to their collection of chemical specimens, if they knew of an easy process by which to prepare it.

Some years ago Doebereiner and Magnus described a process for its preparation, which consisted in passing a mixture of dry sulphurous acid and oxygen gases through a tube filled with spongy platinum and heated to about 572° Fahr.; but this process requires a somewhat complicated apparatus, and would not be very easy of execution by an amateur manufacturer.

More recently a notice was published in the Comptes Rendus, of a process suggested by M. Ch. Barreswil, for obtaining it by means of anhydrous phosphoric acid. I have tried this process, and have found it to be neither difficult nor expensive. The process was not very minutely described in the notice of it above alluded to, and therefore as the result I have obtained has been perfectly satisfactory,

I am induced to describe the arrangement that was adopted, for the guidance of those who may wish to prepare a specimen of this interesting compound.

I first obtained some highly concentrated oil of vitriol, by heating commercial oil of vitriol in a retort until a considerable portion of weak acid had distilled off, and that which remained in the retort had acquired a density of 1.845. Some anhydrous phosphoric acid was then made by burning phosphorus beneath a receiver placed over a plate of glass, allowing free access for dry atmospheric air. The successive portions of the white flakey substance thus formed were immediately transferred to a wide-mouthed stoppered bottle, until a considerable quantity of it was collected.

On mixing these two acids (SO_3 HO and PO_5) together, strong chemical action, accompanied by great elevation of temperature, occurs, to counteract which, it is necessary to make the mixture in a vessel surrounded by a freezing mixture.

The phosphoric acid was introduced into a stoppered retort, surrounded by a mixture of pounded ice and salt, and the oil of vitrol was gradually added, allowing the temperature to subside between the successive additions. When a quantity of oil of vitriol, equal to about two-thirds the weight of the phosphoric acid, had been thus added, the mixture, which acquired a dark-brown colour, was removed from the cooling bath, and a receiver was placed there, to which the retort was adapted. A gentle heat was now applied to the retort, and dense white vapours soon began to pass into the receiver where they were condensed by the cold. In this way a considerable quantity of beautiful white silky crystals was obtained. The whole process occupies but a short time, and no other precaution is necessary in conducting it, than that of avoiding too great an elevation of temperature on mixing the oil of vitriol with

the dry phosphoric acid. With careful manipulation, one ounce of phosphorus, being first converted into anhydrous phosphoric acid by combustion in dry air, and subsequently into glacial phosphoric acid by dehydrating the oil of vitriol, would yield about an ounce of the anhydrous sulphuric acid. The process, therefore, at the present low price of phosphorus, is inexpensive as well as easy of execution.

It may be well to mention, as a caution to those who are not acquainted with the properties of this body, that although, in its anhydrous and crystalline state, it has none of the characters of an acid, not even changing the colour of blue litmus, nor attacking the skin when applied to it, yet so powerful is its tendency to absorb water and pass to the state of the highly corrosive oil of vitriol, that the addition of a few drops of water to it in a bottle causes a dangerous explosion, from the great and sudden evolution of heat which takes place.—*Pharm. Journ.*

ART. LXVI.—IMPURITIES IN COMMERCIAL HYDROCHLORIC ACID.

By Mr. Thomas H. Savory.

There are two kinds of hydrochloric acid commonly kept by Chemists and Druggists, one of which is recognized as pure and fit for use in medicine, while the other is avowedly impure, and only adapted for economical and manufacturing purposes. The pure acid is colourless, while the other is always more or less coloured by reason of the impurities present. Among the impurities mentioned in Chemical and Pharmaceutical works, as most commonly occurring in this

acid, are iron, sulphuric acid, free chlorine, nitrous acid, arsenic, and lead. Sulphurous acid is also mentioned by Professor Graham as existing in this acid, but little or no notice is taken of this impurity in the works most generally referred to by Druggists.

Some impure hydrochloric acid having been used for generating carbonic acid gas in some of the operations conducted by the laboratory pupils here, the evolved gas was found to be largely contaminated with sulphurous acid. Subsequent specimens of acid obtained from several different manufacturers afforded similar results; and on submitting these speciments to a more careful examination, it appeared that sulphurous acid was not only present, but formed an important constituent, as the following analyses will show:—

No. 1.

Sp. gr. at 60° *F.* 1.166.

COMPOSITION.	GRAINS.
Hydrochloric Acid	29.9349
Sulphurous Acid	10.8450
Sulphuric Acid	.1538
Perchloride of Iron . . .	.8364
Water	58.2299
	100.000

No. 2.

Sp. gr. at 60° *F.* 1.163.

COMPOSITION.	GRAINS.
Hydrochloric Acid	31.3708
Sulphurous Acid	7.0530
Sulphuric Acid	.0738
Perchloride of Iron	.0052
Water	61.4972
	100.000

No. 3.

Sp. gr. at 60° *F.* 1.1638.

COMPOSITION.	GRAINS.
Hydrochloric Acid	28.7278
Sulphurous Acid	8.4152
Sulphuric Acid	.1562
Perchloride of Iron	.0461
Water	62.6549
	100.000

The presence of sulphurous acid in such large proportions is no doubt principally due to the use of impure salt and oil of vitriol in the process of manufacture, the organic matter present being oxidized at the expense of some of the oxygen of a portion of the sulphuric acid. It may also in part arise from the employment of iron retorts, and from the application of too high a temperature, which would decompose the bisulphate of soda and liberate the volatile anhydrous sulphuric acid, together with sulphurous acid and oxygen gas. The method I adopted for estimating the sulphurous acid was to precipitate the sulphuric acid with chloride of barium, then to neutralize the remaining free acid with potash—to evaporate the solution to dryness—to fuse the resulting salt with nitrate of potash—to dissolve in water, and estimate the sulphurous acid originally present from the precipitate now afforded with chloride of barium.

It appeared desirable that the attention of Chemists and Druggists should be directed to this subject, as it is evident that the common hydrochloric acid of commerce ought not to be employed in any Pharmaceutical processes.—*Pharm. Jour.*

ART. LXVII.—ON THE VARIOUS APPLICATIONS OF GUTTA PERCHA.

By Mr. Whishaw.

At a meeting of the British Association, Mr. Whishaw read a paper giving an explanation of the various applications of gutta percha; numerous specimens of which in the shape of thread, cord, tubular staves, driving bands, constables' staves, sticks, whips, inkstands, medallions, shields, water buckets, stereotype plates, and almost every other description of article, both useful and ornamental, were present. The paper, after stating that gutta percha was the concrete juice of a large tree of the same name, abounding in Borneo, &c., obtained by tapping the tree periodically by the Malays, stated that its introduction into this country was purely accidental; Dr. Mortgomery having transmitted the first sample of it to the Society of Arts, in 1843, at which time he (Mr. Whishaw) was secretary to that Society. The first articles of use made of gutta percha in this country were laid before the Society of Arts in 1844, and consisted of a lathe-band, a short length of pipe, and a bottle-case, which he had himself made by hand, having caused the concrete substance to become sufficiently plastic by immersing it in hot water. He also produced casts from medals, which attracted considerable attention at the time, and surgical instruments were soon after made of this new material. It was also adapted to commercial uses; and from the period mentioned to July 11th, in the present year between 600 and 700 tons had been imported from the Gutta Percha Company. From twenty to sixty tons were now regularly imported every month. Contrary to the general opinion that gutta percha is a simple, hydrogenous substance, Mr.

Crane (chemist to the Gutta Percha Company,) found it in its ordinary state to consist of at least two distinct materials, besides a notable proportion of sulphur—viz.: 1. A white matter, gutta percha in its pure state; 2. A substance of a dark-brown colour. Various experiments were made to ascertain its strength when mixed with other matters, and also as to what pigments would mix with it without rendering it brittle or deteriorating its qualities. From these it appeared that the only pigments that could be altogether relied on to be used with gutta percha were orange lead, rose pink, red lead, vermilion, Dutch pink, yellow ochre, and orange chrome. Under the influence of heat and pressure, gutta percha would spread to a certain extent, and more so if mixed with foreign matters. All the mixtures composed of gutta percha and other substances which had been subjected to experiments, except that containing plumbago, were found to increase its power of conducting heat; but in its pure state gutta percha was an excellent non-conductor of electricity. The best composition for increasing the pliability of gutta percha was that formed in conjunction with caoutchouc tar, and next in order that of its own tar; and the best material at present known for moulding and embodying, was obtained by mixing gutta percha with its own tar and lamp black. In describing the process of manufacturing gutta percha, the author observed, that rude blocks of the material were first cut into slices, by means of a cutting machine formed of a circular iron plate of about five feet in diameter, in which there are three radical slots furnished with as many knives or blades. The blocks are placed in an inclined shoot, so as to present one end to the operation of the cutters. The slices are then placed in a wooden tank, containing hot water, in which they are left to soak until found in a plastic state. They are afterwards passed through a mincing cylinder, similar to that used in paper mills for the conversion of rags into pulp, and then thoroughly cleansed in cold water tanks; the

water, in cases of impure gutta percha, being mixed with a solution of common soda or chloride of lime. It is next put into a masticating machine, such as is used in the manufacture of caoutchouc, and then pressed through rollers; thus being connected into sheets of various widths and thickness. When necessary, the sheets are again masticated, and again passed through rollers. These sheets are subsequently cut into boards with vertical knives, placed at the further end of the table, along which the sheets are carried by a cloth or web to another roller, round which they pass, and are cut into the required widths. The bands or straps are then removed and coiled up ready for use. Driving bands for machinery are thus made, and shoe soles and heals are stamped out of similar sheets of gutta percha. In making tubes or pipes, either of gutta percha or any of its compounds, a mass of gutta percha, after being thoroughly masticated, is placed in a metal cylinder furnished with a similar piston, by which it is pressed down into an air-box, kept hot by steam, which has at its lower end a number of perforations, through which the plastic material is forced into a cup, whence it passes out, round a core, into the desired tubular form, and thence through a gauge to the required size, and into a receiver of cold water, being drawn to the other end of a long trough by a cord passing round a pulley at the far end of the trough, and returning to the person in attendance on the machine, who gradually draws the pipe away from the air machine. Thus tubes of considerable length and diameter are made to a very great extent, and are used for the conveyance of water and other liquids, and are now under test for the conveyance of gas. The paper next explained the variety of articles already made of gutta percha, which were of three classes—1. Useful. 2. Ornamental; and 3. Useful and ornamental combined. Various articles were then exhibited, including two very handsome shields, and a splendid communion dish and service. Mr. Whishaw next exhibited the Telakouphanon, or Speaking Trumpet,

and in doing so, said that speaking tubes of gutta percha were quite new, as was also the means of calling attention by them of the person at a distance, which was accomplished by the insertion of a whistle, which being blown, sounded at the other end quite shrilly. Attention having been thus obtained, you remove the whistle, and by simply whispering, the voice would be conveyed quite audibly for a distance of at least three quarters of a mile, and a conversation kept up. It must be obvious how useful these telegraphs must become in large manufactories; and indeed in private houses they might quite supercede the use of bells, as they were so very cheap, and by branch pipes could be conveyed to different rooms;—and, indeed, if there were no electric telegraphs, they might, by a person being stationed at the end of each tube of three quarters of a mile or mile, be made most speedily to convey intelligence for any distance. In private houses the whistle need not be used, but a more musical sound could be produced. He then amused the auditors by causing the end of the tube, which was of the length of 100 feet, to be inserted into the mouth-piece of a flute held in a person's hand, regulated the notes, and placing his own mouth at the other end of the tube, "God save the Queen" was played at a distance of 100 feet from the person giving the flute breath. Turning to the Bishop of St. David's he said that in the event of a clergyman having three livings, he might, by the aid of three of these tubes, preach the same sermon in three different churches at the same time. Mr. Whishaw also exhibited the gutta percha submarine rope or telegraph; which consisted of a tube perforated with a series of small tubes, for the conveyance of telegraphic wire, and which, for the purpose of preventing its being acted upon by sea water or marine insects, was banded or braided round by a small rope, and its being perfectly air-tight would render it quite impervious to the atmosphere.—*Pharm. Journ., from Athenæum.*

ART. LXVIII.—ON THE OCCURRENCE OF BERBERINE IN THE ROOT OF THE BARBERRY AND COLUMBO.

By Dr. C. Bödeker.

The root of *Cocculus palmatus*, which has long been exported under the name of Columbo root from the East Indies for therapeutical purposes, contains, as is well known, a non-nitrogenous substance, columbine, which has hitherto been little examined, and which the author had selected as a fit subject for investigation. In the preparation of this substance he found along with the colourless crystals of columbine some beautiful golden crystals, which dissolved readily in hot lime-water with a dark red colour, from which solution they separated on the addition of an excess of hydrochloric acid in light golden yellow needles, which easily dissolve in pure water. From the behaviour of this solution it was evident the crystals were the chlorine compound of an organic base. On this account the substance in question was prepared in larger quantity in the following manner:—The Columbo root was exhausted with hot alcohol of 0.889, as much of the alcohol as possible removed by distillation; and when a yellowish-brown mass of impure columbine had separated after three days' standing, the supernatant liquid, together with the aqueous solution arising from the rinsing of the impure columbine, was evaporated to dryness in the water-bath. The residue was exhausted with boiling alcohol of 0·863 spec. grav., and this solution again treated as the preceding one. The residue was then treated with boiling water, and the filtered solution mixed with a considerable quantity of muriatic acid. The precipitate thus formed was collected on a filter and well pressed between paper. Owing to its great solubility in pure water and alcohol, it could not be washed,

To remove any free adherent acid, it was dissolved in alcohol of 0·863, and precipitated from this solution by ether. The salt so obtained was an indistinctly crystalline bright yellow powder of a disagreeable bitter taste. An aqueous solution of it furnished yellow amorphous precipitates with chloride of platinum, perchloride of mercury, tannic acid, chlorate and chromate of potash. The dry salt disengaged ammonia when heated with soda lime, but the aqueous solution afforded no ammonia when treated with potash.

All these properties indicated that the organic base combined with hydrochloric acid must either be berberine or one very similar to it. Several careful analyses, the results of which agree with the known composition of berberine, have proved that this substance is really berberine, and that consequently the same organic base is produced in the root of the European *Berberis* and the root of the East Indian *Cocculus*.

This circumstance merits attention in a therapeutical point of view, since the berberine is present to a large amount in the Columbo root, and indeed to a much greater extent than the columbine. While the latter is almost insoluble in water and but sparingly soluble in cold alcohol, berberine is abundantly dissolved by hot water and by alcohol; so that in using an aqueous extract of Columbo, besides starch, berberine alone can be looked upon as the essential principle.

This occurrence of berberine in *Berberis* and *Cocculus* is also interesting in a botanical point of view. The true alkaloids, with the exception of caffeine, which however likewise differs from them in its behaviour, exhibit in their distribution a relation with the natural affinities of the plants. The views of botanists respecting the correct systematic position of the *Berberideæ* are still divided. Bartling arranges them with *Menispermeæ* to which *Cocculus* belongs, and forms of these two families the class *Cocculinæ*

The production of the same peculiar vegetable principle in plants of the two families supports this view.

The peculiar vegetable principles to which the alkaloids belong are said nearly all to occur in the so-called laticiferous vessels, and never in the cells of the plant. A microscopic examination of the roots of *Cocculus palmatus* and *Berberis vulgaris* showed however that in both the berberine is deposited in the thickening layers of cellular membrane.

With respect to columbine, the small quantity procured by the author did not admit of his arriving at perfectly satisfactory results as to its composition. The mean of two analyses led to the formula $C^{14}\ H^{8}\ O^{5}$.

From the mode of occurrence of columbine in the Columbo root it is probable that its production in the vegetable organism precedes that of the berberine, as the columbine is found only in the exterior and younger parts of the parenchymatous tissue, while scarcely any is observed where vascular bundles are developed.

If we suppose that the base has been formed from the non-nitrogenous body by the action of ammonia, a remarkable relation is evident between columbine and berberine on the one hand and picrotoxine and menispermine on the other. The basic menispermine occurs in the shells of the fruit of *Anamirta cocculus* which are exposed to the reducing action of sunlight; the picrotoxine is met with in the kernels. While in the present instance the formation of the base from the non-nitrogenous body is connected with a process of deoxidation, in the case of the root of *Cocculus palmatus*, which is protected from the sunlight, it is connected with a process of oxidation.

When 3 equivs. of oxygen are added to 3 equivs. columbine and 1 equiv. ammonia, and 9 equivs. water removed, the composition of berberine is obtained. The author is at present engaged with experiments in this direction.—*Chem. Gaz. from Journ. für. Prakt. Chem.*

ART. LXIX.—ON THE ESSENTIAL OIL OF MATRICARIA PARTHENIUM.

By Messrs. Dessaignes and Chautard.

The plant was collected during the period of flowering, and the upper half, stem, leaves and flowers submitted to distillation; a small quantity of a greenish volatile oil was collected. The oil obtained in the dry hot summer of 1846 became filled in the course of twenty-four hours with large crystalline laminæ of stearoptene. No trace of stearoptene was obtained from oil distilled in 1845. The produce of the two years was united, and exposed to a temperature of 24° F., when it deposited numerous crystals. The stearoptene separated from the oil was strongly pressed between folds of paper, and then exposed to the air for several days. The mass, at first homogeneous and granulated, when thus deprived of oil became firm, brittle, and assumed a crystalline appearance. The pure stearoptene has a strong odour of camphor; it melts at 340°, boils at 399°. The stearoptene, when burned with oxide of copper, gave—

	Found.	Calculated.
Carbon . . .	78·76	78·94
Hydrogen . . .	70·60	10·53
Oxygen . . .	—	10.53

It is consequently identical with the camphor of the laurels, the presence of which has already been pointed out by Proust in several volatile oils derived from the *Labiatæ*, and which is now shown to exist in a plant belonging to the *Compositæ*. The oil of *Matricaria*, separated from the camphor by the preceding operations, dried over chloride of calcium, and burnt, furnished carbon, 77·60, and

hydrogen, 10·37. Some oil prepared in 1847, and which had spontaneously deposited a small quantity of camphor, was dried over chloride of calcium and analysed; it gave 77·96 per cent. C, and 10·60 H.

The oil of *Matricaria* is evidently a mixture; even that which has been submitted to great cold still contains a considerable quantity of camphor. It began to boil at about 310°, but the thermometer rose rapidly to 400°, and the greater portion of the oil distilled over between 400° and 428°, leaving a coloured residue. The last half of the product, which had been collected between 394° and 428°, deposited, when submitted to a very low temperature, a large amount of camphor, which was separated. The oil was distilled several times over caustic lime, collecting the products at separate intervals; but no oil was obtained with a constant boiling-point. All the portions collected between 392° and 428° always afforded camphor on cooling, and sometimes to such an extent that the product of distillation congealed to a soft mass in the neck of the retort. We will enumerate a few of our analyses. I. is of oil collected between 310° and 334°; II. between 338° and and 356°; III. between 390° and 420°; and IV. between 420° and 428°:—

	I.	II.	III.	IV.
Carbon . . .	86·46	85·77	77·02	76·92
Hydrogen . .	11·58	11·22	10.24	10·37

The volatile oil of *Matricaria* most probably contains, besides camphor, a hydrocarbon of the formula $C^5 A^4$, and an oil containing more oxygen than camphor.—*Chem. Gaz., from Jour. de Phar. et de Chim.*

ART. LXX.—PREPARATION OF SULPHATE OF PHILLYRENA A NEW FEBRIFUGE.

Prof.. Jachelli, of Ferrara, has proposed the introduction into the materia medica, of the Phillyrea latifolia, and sulphate of Phillyrena, as a febrifuge. The incised phillyrena (6 kilogr.) is boiled for two hours in water (50 kilogr.) and concentrated sulphuric acid, (250 gram.) The liquid is filtered hot. This is repeated three times to exhaust the article. The decoctions are mixed, allowed to cool, and neutralized by lime. The precipitate is thrown on a filter and washed with cold water, then dried at a temperature from 40° to 50° R. It is then digested over alcohol at 36°, boiled for an hour in an alembic to collect the excess of alcohol; filtered while hot, the alcohol evaporated, and diluted sulphuric acid added to saturate the phillyrene. In a few days crystals will be deposited, which may be purified by animal charcoal. These crystals present the appearance of silken flock-like asbestos, of a light bitter taste. It is administered in the dose of three-fourths to one gramme in the apyrexia ten to fifteen grains.—*L'abeille Medicale.*

ART. LXXI.—THE BARK OF THE ADANSONIA DIGITATA, OR BAOBAB TREE, A SUBSTITUTE FOR CINCHONA BARK.

By Dr. Duchassaing.

Attempts have been made at different periods to find substitutes for the cinchona barks and the alkaloids obtained from them, as the use of these substances in medicine is not unattended with inconvenience. Among the inconveniences which apply to the use of the cinchonas, are, the bitter taste of their active principles, and the scarcity and consequent high price of the barks; moreover, when administered in large doses, their anti-periodic effects are often accompanied by considerable derangement of the system.

Dr. Duchassaing, in a paper published in the *Journal de Pharmacie* for June, has directed attention to the bark of the *Adansonia digitata*, or *Baobab tree*, as a valuable remedy for fevers, and capable of replacing the cinchonas.

This tree is a native of Senegal. It is placed by De Candolle in the natural order *Bombaceæ*. It is a tree of moderate elevation, but whose trunk is of vast thickness, having a diameter of twenty or thirty feet. The fruit called *monkey's bread*, is acidulous, and is used by the natives in pulmonary affections, and as a common article of food.

The bark, which is the part now recommended to be used medicinally, is mucilaginous, but has scarcely any taste or smell.

Dr. Duchassaing recommends its administration in the form of decoction, made by boiling half an ounce of the bark in one pint of water, until reduced to two-thirds. This decoction is transparent, of a reddish colour, and has a smell slightly resembling that of decoction of cinchona bark. It contains a large quantity of mucilage, and has but little

taste. When sweetened with sugar, it is not at all disagreeable.

The principal inconvenience attending this form of administration, is, that the decoction soon undergoes decomposition. This may, to a certain extent be prevented, by adding a small quantity of sulphuric acid, which precipitates the mucilage, or by the addition of spirit.

According to Dr. Duchassaing, this remedy produces no appreciable disturbance to the nervous system. In some cases he has observed that it renders the pulse rather less frequent. It improves the appetite, and causes a determination to the skin.

In a great number of cases in which it has been applied as a remedy for intermittent fevers, it has proved eminently serviceable.—*Pharm. Journ.*

ART. LXXII.—NOTE ON THE BOILING AND DISTILLATION OF LIQUIDS IN GLASS VESSELS.

By Mr. Theophilus Redwood.
Professor of Chemistry and Pharmacy to the Pharmaceutical Society.

In a communication made to the Pharmaceutical Society about two years ago, "On the influence of Cohesion and Adhesion on the Boiling and Evaporation of Liquids," and which was published in this journal, vol. vi., page 119, I alluded to some cases in which it is found difficult to effect the distillation of liquids in glass vessels. This difficulty arises from the occurrence, in certain liquids, of the phenomenon commonly called *bumping*. It is frequently ex-

perienced in the process for preparing the *diluted hydrocyanic acid* of the London Pharmacopœia, and to a much greater extent in distilling oils and resins with spirit or water. My attention was more particularly directed to the subject in connexion with a series of investigations I had occasion to make with the view of determining the quality of some specimens of *balsam of copaiba.* Some of the results of these investigations are published in the journal, vol. vi., page 13. In attempting to effect the separation of the essential oil from the resin of the oleo-resinous balsam, by distilling it with water in a glass retort or flask, I found it impossible to continue the distillation for a sufficient length of time to complete the analysis, in consequence of the bumping which took place, and which became more and more violent as the process proceeded.

On repeating the experiments with other oils and resins, similar phenomena were found to occur. Thus, for instance, if a piece of common resin or of shellac be introduced into a globular flask nearly filled with distilled water, and if the water be boiled over the flame of a gas lamp, the ebullition will at first take place pretty uniformly; but after some time it will be observed that the bubbles of steam which are formed at the bottom of the flask, in contact with the most heated part of the glass, will be larger than they were in the first instance; and instead of their passing continuously through the liquid, there will be frequent intermissions, during which ebullition will entirely cease. After each of these intermissions the disengagement of steam will take place with increased violence, and as the process is continued, the length of the intermissions will become greater. If a thermometer be introduced into the flask, it will be found that this irregularity of ebullition is accompanied by great variations of temperature. While the bubbles of steam are passing freely through the liquid, the temperature will be from 212° to 214° Fahr., but when a

cessation of ebullition takes place, the temperature will rise and will sometimes reach 220°. This will be followed by a sudden and violent evolution of steam, constituting the phenomenon of *bumping*, by which the accumulated heat is disengaged, and the temperature of the liquid reduced again to its usual boiling point. The violence of these explosions will, after some time, become so great as to cause the projection of a considerable part of the liquid, at once out of the flask, endangering in no slight degree the safety of the operator. This may be taken as a forcible illustration of the phenomena which accompany the bumping of certain liquids when boiled in glass vessels; but the effects are seldom so marked as in this case.

Several attempts have been made to explain these phenomena, but without much success. They have been ascribed to a modification of the forces of *cohesion* and *adhesion* in the liquid, caused by the expulsion of atmospheric air during the process of ebullition; Donné having shown that some liquids acquire greatly increased cohesive and adhesive force when air is wholly excluded from them. It may, indeed, be readily admitted that the immediate cause of the bumping of liquids is some modification of the forces of cohesion and adhesion; but that this condition is induced simply by the expulsion of air, is a position that will not be so readily assented to.

The effect appears to depend, partly on the condition of the liquid in which it occurs, and partly on that of the vessel containing the liquid.

It was found by Marcet, and I have repeatedly verified the results, that if pure water be put into a glass flask, which has previously had *oil of vitriol* heated in it, the boiling-point of the water will sometimes rise as high as 220°; while, on the other hand, if the inner surface of the flask be coated with a thin film of *shellac*, the boiling-point of pure water heated in it will be sensibly below 212°. In

a metallic vessel the same liquid would boil precisely at 212°, and in a glass vessel, in its usual condition, without any previous preparation, the boiling-point would be a little above 212°. In these cases the boiling-point of the liquid appears to have some relation to the condition of the surface of the containing vessel, and to be unconnected with the presence or absence of air in the liquid.

There are other cases, as already shown, in which certain substances, dissolved or suspended in the liquid, occasion variations in the boiling-point as great as those noticed by Marcet. Some salts, and especially resins and oils, belong to this class; and it is worthy of remark that the same substance, *shellac* for instance, when spread over the surface of the glass, produces an effect the opposite of that which occurs when it is merely suspended in the liquid. In the one case the boiling point is reduced, while in the other it is raised to the extent of seven or eight degrees. But these variations, caused by the presence of substances dissolved or suspended in the liquid, do not occur in metallic vessels. The water containing shellac, which boils at 220° in a glass flask, if put into a metallic vessel will boil steadily at 212°, without the slightest tendency to bumping. Indeed, I have invariably found that liquids, the ebullition of which, in glass vessels, is accompanied by even the most violent bumping, present no such phenomenon when boiled in metallic vessels.

The effects which I have observed in a great number of cases have suggested the probability of their being connected with the electrical condition of the liquid operated upon, and of the vessel containing it. It is not my purpose, however, on the present occasion, to enter into any details with the view of explaining the cause of these phenomena, but to describe the means by which their occurrence may be prevented, and, moreover to describe an arrangement of

apparatus which I have found convenient for effecting the distillation of small quantities of *balsam of copaiba*.

Having observed that liquids, which are subject to bumping when boiled in vessels of glass, present no such effect if the process be conducted in those made of metal, I thought it probable that by coating the inner surface of the glass with silver, in the manner adopted by Mr. Drayton, the irregularity of ebullition alluded to would be prevented. This I have found to be the case, and I have repeatedly used glass flasks coated on the inside with silver, for the distillation of balsam of copaiba, without experiencing inconvenience from the bumping of the liquid. The method I have adopted for preparing the flasks has been to throw down the silver by Drayton's process, so as to cover the lower part of the vessel, while the upper parts are left unsilvered. This is effected by introducing as much of the ammoniacal solution of silver as will cover the part to be coated. After the silver has been deposited by the addition of the essential oils, it is necessary to clean the flask from adhering oil by means of rectified spirit, several successive quantities of which should be boiled in it until the silver becomes perfectly clean and bright, and no smell of the oil remains. When the process has been successfully performed, and every trace of oil removed, the coating of silver may be rendered thicker by depositing a fresh portion of metal, from a solution of oxide of silver in cyanide of potassium, by electricity.

Glass vessels may also be covered with platinum, by putting into them a solution of the chloride of that metal, adding thereto some *formic acid*, and then boiling the mixture. The coating of metallic platinum thus obtained, will not, generally, be so perfect and uniform as that of the silver deposited by the preceding process; but I have frequently succeeded in getting a deposit of perfectly bright platinum in this way, which has adhered very strongly to

the glass, and has not been separated by the action of strong acids and other substances repeatedly boiled in the vessel.

[We have omitted the description of an apparatus of which a figure was attached, used by Mr. Redwood for his experiments in the distillation of balsam of copaiba, which consists of a flask with a U-tube for a receiver, connected with the flask by a small tube.—*Ed. Am. Jour. Pharm.*]

The introduction of pieces of platinum wire or clippings into the flask or retort has been recommended for preventing irregularity of ebullition in some liquids, especially in the distillation of *oil of vitriol*; but I have not found this to be a complete remedy for the evil alluded to in any case, and in most cases it appears to be of no use.

A French Chemist, M. Lambert, has proposed the employment of fragments of a species of quartz (*quarzite*,) which are to be introduced into the glass retort, in the distillation of oil of vitriol. It is stated that the presence of a few angular pieces of this substance in the retort will render the distillation of several pounds of the acid quite manageable and easy. I have not been able to ascertain with certainty what mineral is referred to by the name of *quarzite*, but I find that fragments of *rock crystal* produce the effect indicated remarkably well. Pieces of rock crystal suitable for this purpose, consisting of the chippings formed in making spectacle-glasses, may be obtained at a lapidary's or optician's. In all cases of irregular ebullition in which I have tried the use of this substance, it has proved completely successful. The effect of introducing five or six pieces of the rock crystal into a liquid, such as the mixture of balsam of copaiba and water, which cannot be distilled alone in a glass vessel, is most marked and satisfactory; the irregularity of ebullition instantly ceases, and the process may be continued for any length of time without a return of the bumping. This is certainly the most simple and easy method of preventing the evil alluded to.

It might be supposed that broken fragments of glass or sand would answer the same purpose as rock crystal; but such I have not found to be the case.—*Pharm. Journ.*

ART. LXXII.—ON THE PRODUCTION OF FURFUROL.

By Geo. Fownes, F.R.S.

Professor of Practical Chemistry, University College, London.

In the year 1845, I published an account of the artificial formation of a vegeto-alkali, resembling in many particulars those occurring in cinchona-bark, produced by the action of ammonia on a volatile oil, generated or developed by heating a mixture of wheat-bran and sulphuric acid. I was indebted to Mr. Morson for the oil itself so described; it had been in his possession several years, having been presented to him by Mr. Wm. Coley Jones, who had both discovered it and prepared it on a large scale, hoping to turn it to some practical use. Mr. Jones gave it the name *furfurol* from its origin, and published at the time a description of the oil and some of its peculiarities.

The examination of this substance soon showed its identity with an oily matter sometimes produced in preparing formic acid by the artificial process which had been noticed by Dœbereiner, under the name of *artificial oil of ants*, and more carefully examined by Dr. Stenhouse, who succeeded in procuring it in larger quantity by distilling wheat-flour with slightly diluted sulphuric acid. The analyses of Dr. Stenhouse, which agree exactly with my own, assign to furfurol the formula $C^{10}H^{4}O^{4}$, or the triple of this, $C^{10}H^{4}O^{4}$

the glass, and has not been separated by the action of strong acids and other substances repeatedly boiled in the vessel.

[We have omitted the description of an apparatus of which a figure was attached, used by Mr. Redwood for his experiments in the distillation of balsam of copaiba, which consists of a flask with a U tube for a receiver, connected with the flask by a small tube.—*Ed. Am. Jour. Pharm.*]

The introduction of pieces of platinum wire or clippings into the flask or retort has been recommended for preventing irregularity of ebullition in some liquids, especially in the distillation of *oil of vitriol;* but I have not found this to be a complete remedy for the evil alluded to in any case, and in most cases it appears to be of no use.

A French Chemist, M. Lambert, has proposed the employment of fragments of a species of quartz *(quarzite,)* which are to be introduced into the glass retort, in the distillation of oil of vitriol. It is stated that the presence of a few angular pieces of this substance in the retort will render the distillation of several pounds of the acid quite manageable and easy. I have not been able to ascertain with certainty what mineral is referred to by the name of *quarzite*, but I find that fragments of *rock crystal* produce the effect indicated remarkably well. Pieces of rock crystal suitable for this purpose, consisting of the chippings formed in making spectacle-glasses, may be obtained at a lapidary's or optician's. In all cases of irregular ebullition in which I have tried the use of this substance, it has proved completely successful. The effect of introducing five or six pieces of the rock crystal into a liquid, such as the mixture of balsam of copaiba and water, which cannot be distilled alone in a glass vessel, is most marked and satisfactory; the irregularity of ebullition instantly ceases, and the process may be continued for any length of time without a return of the bumping. This is certainly the most simple and easy method of preventing the evil alluded to.

It might be supposed that broken fragments of glass or sand would answer the same purpose as rock crystal; but such I have not found to be the case.—*Pharm. Journ.*

ART. LXXIII.—ON THE PRODUCTON OF FURFUROL.

By Geo. Fownes, F.R.S.

Professor of Practical Chemistry, University College, London.

In the year 1845, I published an account of the artificial formation of a vegeto-alkali, resembling in many particulars those occurring in cinchona-bark, produced by the action of ammonia on a volatile oil, generated or developed by heating a mixture of wheat-bran and sulphuric acid. I was indebted to Mr. Morson for the oil itself so described; it had been in his possession several years, having been presented to him by Mr. Wm. Coley Jones, who had both discovered it and prepared it on a large scale, hoping to turn it to some practical use. Mr. Jones gave it the name *furfurol* from its origin, and published at the time a description of the oil and some of its peculiarities.

The examination of this substance soon showed its identity with an oily matter sometimes produced in preparing formic acid by the artificial process which had been noticed by Doebereiner, under the name of *artificial oil of ants*, and more carefully examined by Dr. Stenhouse, who succeeded in procuring it in larger quantity by distilling wheat-flour with slightly diluted sulphuric acid. The analyses of Dr. Stenhouse, which agree exactly with my own, assign to furfurol the formula $C^5H^2O^2$, or the triple of this, $C^{15}H^6O^6$

presenting the remarkable circumstance of a volatile oil containing hydrogen and oxygen in the proportions to form water.

When furfurol is put into a solution of ammonia, and the whole left to stand a few hours, combination takes place, and a yellowish-white, crystalline, insoluble substance is produced, containing $C^{15}H^{6}NO^{3}$, or the elements of furfurol and ammonia, *minus* those of three equivalents of water. This substance is instantly decomposed by acids, with reproduction of furfurol and a salt of ammonia. From these characters I considered it allied to the *amides*, and named it accordingly *furfurolamide*.

When furfurolamide is heated with a solution of potash, no disengagement of ammonia or other evident mark of decomposition occurs, but an isomeric or molecular change takes place, and the furfurolamide passes into a new body, *furfurine*, having the same composition, but totally different properties, those namely of a powerful salt-base, capable of forming a series of well-defined and crystallizable saline compounds, having an alkaline re-action to test-paper, and even expelling ammonia from sal-ammoniac when boiled with a solution of that substance.

Since the preceding experiments were published, Mr. Jones has kindly favoured me with a description of his original process for preparing furfurol, with permission to make it known. This I do with pleasure, both on account of the interest attached to the chemical history of the product, and the ingenuity of the process itself, which is applicable to a variety of other purposes.

Wheat-bran to the amount of ten cwt. was cautiously mixed in a large wooden vessel lined with lead, with five cwt. of oil of vitriol, diluted with an equal bulk of water and still hot, the acid being added by small portions, with constant stirring, to avoid carbonization. The dark, pulpy, fruity smelling mixture was then immediately transferred

to another vessel, constructed in the same manner, of wood lined with lead, and furnished with a closely-fitting cover which could be made air-tight by luting. A pipe conveying steam passed to the bottom of this vessel, and there terminated in a flat coil perforated with numerous holes. A second pipe inserted in the cover, communicated with a condensing worm abundantly supplied with cold water. The joints of the apparatus being secured, the steam was admitted, and the distilled liquid, to the extent of six hundred gallons or more, collected in a suitable receiver. This liquid was a weak solution of furfurol. On re-distillation two or three times repeated, until more water came over, the furfurol began to separate as a heavy, yellowish oil, and by a repetition of this process, the whole was eventually procured: the ten cwt. of bran yielded about one gallon of crude furfurol, or 7-28th part. Wheat starch-maker's refuse, or "grains," treated in a similar manner, yielded very pure furfurol.

On repeating this operation on a very much smaller scale, I found it to succeed equally well. The distillatory vessel was replaced by a common stone-ware jar closed by a large cork, which held the mixture of bran and acid; steam was admitted from a small boiler by means of a perforated coil of pewter pipe resting on the bottom of the jar, while the vapours were conveyed away by another pipe to a condenser. Sixty-four troy ounces of bran, thirty-two ounces of oil of vitriol, and an equal bulk of water gave about one ounce of furfurol. Two gallons of liquid were collected, and redistilled many times in the manner above pointed out; the first half only being received, until all the oil was separated. A third gallon contained very little of the oil, showing that it is unnecessary to collect more than about half a gallon of liquid for each pound of bran employed.

A number of experiments were next made with a view of discovering, if possible, the nature of the substance pre-

sent in bran, which, by the action of sulphuric acid, yields the oil. The following are the results, which, although not decisive, serve to narrow considerably the question. The process was in each case conducted in the same manner, and with the apparatus already described.

Fine Wheat Flour.—64 troy ounces of flour, 32 ounces oil of vitriol, and an equal bulk of water, yielded about 1½ drachms of pungent and impure furfurol.

Potato Starch.—4 lb. of starch, 2 lb. sulphuric acid, and an equal bulk of water, gave merely indistinct traces of furfurol. The residue in the jar was a brown pulverulent substance, partly soluble in solution of caustic potash, and apparently a mixture of ulmine and ulmic acid.

Woody Fibre.—2 lb. new linen cut into small shreds and well washed with boiling water, 1 lb. sulphuric acid, and an equal bulk of water gave not the least indication of furfurol.

It was interesting to remark, however, the presence in the distilled liquid of a minute quantity of solid white volatile fatty matter, illustrating the universal diffusion of fatty substances in the vegetable kingdom, since they occur in such a body as linen thread. The residue in the jar consisted of brown insoluble matter, with a little unaltered fibre. This experiment was again repeated with a similar result.

Bran perfectly freed from starch, gluten, &c., either by being steeped in a cold dilute solution of caustic potash, or mixed with water only, and left to ferment, well washed and dried, yields a greatly increased product of furfurol. In one experiment 32 troy ounces of bran thus prepared, with the usual proportions of sulphuric acid and water, yielded 1072 grains of furfurol, or 1-14th of its weight. In a second experiment 80 troy ounces of the same gave 2959 grains of furfurol, or 1-13th of its weight. In the practical preparation of furfurol, therefore, should this ever become an object of importance, it will be very advantageous to adopt this

plan and to operate upon bran thus exhausted by either method, and afterwards dried in the sun, or otherwise. When mixed with the acid, the exhausted bran does not become pasty and adhesive, as happens with bran in its ordinary state; the mixture is thus more quickly and easily made and handled.

Other vegetable tissues besides bran yield furfurol when thus treated, as beech-sawdust, of which 38 ounces, finely sifted, afforded not less than one ounce of the oil, very pure and free from pungency. From these experiments I am inclined to hazard the conjecture that the substance which yields furfurol may possibly be the *matière incrustante* of M. Payen, which forms an important constituent of ordinary woody tissue. The bran, after exhaustion by potash, or by the lactic acid developed by fermentation, and well washed, is reduced to a mere membrane, which, under the microscope, exhibits a curious dark tesselated or spotted appearance, as if incrusted with regular and uniform patches of brownish opaque matter.

The following particulars may now be added to the description formerly given of the properties of furfurol, some of which, from the small quantity then at my disposal, were open to correction.

When just distilled, it is nearly colourless, but in a short time becomes yellow even in the dark, undergoing but little further change. Exposed to light it becomes brown in a few hours. In the hydrated state or in contact with water, this change of colour occurs much more slowly. Pure furfurol at 60° Fahr. has the specific gravity of 1.1648. In a glass retort, containing some strips of copper foil, it boils regularly and uniformly at 325° to 326° Fahr., the barometer standing at 29.9 inches. Some blackening and slight decomposition take place with every distillation. It dissolves in twelve parts of water at 60°, and is more soluble at higher temperatures, since a cold, milky, emulsion-like

mixture becomes clear on heating. The specific gravity of the cold saturated solution is 1.0132.

The specific gravity of the vapour of furfurol was carefully determined by the method of Dumas. A little patch of brown matter, the result of trifling decomposition, remained in the globe, but its weight must have been almost inappreciable. The following are the details of the experiment:

Weight of globe, 1347.63 grains.
Temperature of air, 64° Fahr.
Barometer, 30 inches.
Temperature of oil-bath, 380° Fahr.
Weight of globe after experiment, 1356. grains.
Capacity of globe, 23.13 cubic inches.
Residual air-bubble, .12 cubic inch.
Specific gravity of vapour, 3.493.

From this it follows that the formula for furfurol should be the very simple one, $C^5H^2O^2$, and not the triple of this, as formerly assumed, since every volume of vapour will be thus represented:

5 volumes hypothetical carbon-vapour*	. . . .	.4183 × 5 = 2.0915
2 volumes hydrogen	. . .	.0693 × 2 = .1386
1 " oxygen,	. . .	= 1.1057
1 " vapour of furfurol	.	3.3358

Pharm. Journ.

* On the supposition that carbonic acid contains equal volumes of oxygen and carbon-vapour, condensed to one-half.

ART. LXXIV.—ON CHROMIC ACID AS A BLEACHING AGENT, AND ON A CHEAP AND EASY MEANS OF RECOVERING IT.

By Charles Watt, Sen.

Chromic acid has of late years become a very important agent in the bleaching of various articles, and particularly tallow and oils, more especially palm-oil. The best method therefore of using and then recovering it, so that it may again be employed, and the expense of the bichromate of potash, every time the chromic acid is required, be saved, cannot fail to prove of great advantage to all large consumers of this article.

About twelve years since, after numerous experiments and much application, I found that no agent was so effectual for bleaching foul, dark and offensive tallows and deep-coloured oils (namely, palm, linseed and rape oils) as the chromic acid. My only consideration therefore was, in what manner to obtain it in the cheapest form sufficiently pure for the intended purposes; and the deep red salt, the bichromate of potash, was that from the decomposition of which I obtained the acid, in the following manner:—

To bleach half a ton of dark tallow or high-coloured oils, from five to ten pounds of the bichromate of potash is required, and from it the chromic acid is liberated by decomposing the salt thus:—

The bichromate, well-bruised, is put into an earthenware, wooden or leaden vessel (not iron, as the acids act on it,) and about four times as much hot water is then poured into it; the salt is then to be well stirred; afterwards about one and a half pounds of sulphuric acid (for every pound of bichromate) is carefully introduced, and the stirring is continued until the whole of the salt is dissolved. This liquid

is chromic acid, mixed with sulphate of potash and an excess of free sulphuric acid, which is found greatly to assist in the bleaching.

The next part of the operation consists in introducing it into the tallow or oil, which, previously melted and well settled from all extraneous vegetable and animal matters, and at about 130° F., is to be put into a vessel of wood capable of holding half a ton, leaving sufficient room for stirring. So soon as the liquid mixture of chromic acid, as before described, is poured into the tallow or oil, it is to be kept well stirred until the whole of the colour is removed, and a light pea-green has taken its place. The bleaching operation is now complete, and about four pailsfull of boiling water are to be poured in, and the stirring to be repeated for five minutes; the whole is then left to settle for about two hours, when it will be found quite white and fit for use.

It was formerly our custom to add about four or five pounds of muriatic acid to the compound; but Mr. C. Watt, Jun., at the large factory of Messrs. Hawes, found that it increased the trouble and expense, with no real benefit, and therefore he omitted it, and used only sulphuric acid to decompose bichromate of potash.

The expense of bleaching one ton of bad tallow, or any deep-coloured oil, is about £1; it therefore became necessary to devise means of saving the chromic acid; and some years since I converted the oxide contained in the green liquid, left after bleaching, into chromate of lead; but it was found that this article would become so extensive in quantity, that all who used much chromic acid, would be driven into another branch of business quite foreign to their usual occupation; and Mr. C. Watt, Jun., therefore devised the recovery of it into chromate of lime, equally as effectual as applied to bleaching, and much less expensive. His process is as follows:—

The green liquid, left after all the bleached oil is taken off, is put into another tub, and more water is added; then lime, made into a thick cream-like consistence, is gradually poured in till nearly all the sulphuric acid is saturated; the liquid is then run off into another vessel from the sulphate of lime, and into this liquid is to be gradually and carefully introduced some more of the cream of lime, till all the green oxide (powder) is precipitated, and the liquor is clear and colourless; this liquor is to be drained off, and fresh water poured in, and, when settled, it is again to be poured off, and a fresh quantity put in, in order to wash the precipitate; this is at last to be dried, and then put on an iron slab, heated to redness, and kept frequently stirred. From a green it will be gradually changed into a yellow powder, which is the chromate of lime, and which, by being decomposed by sulphuric acid in such quantity as to leave an excess of free sulphuric acid, yields chromic acid, quite as well adapted for bleaching, as that obtained from the bichromate of potash.* By this process the chromic acid can be recovered again and again, *ad infinitum;* and thus the method of bleaching by this agent is at once the most perfect and economical of any yet brought into operation.† It is almost needless to remark, that where, as in the great manufactories in Lancashire, much chromic acid is employed, this easy and cheap mode of recovering it will prove highly beneficial.

It may here be remarked, that several other methods of bleaching tallows and oils have since been tried. One consists in employing what is termed permanganic acid; but this agent so readily parts with its oxygen, that it is un-

* This process is perfectly identical with that described by M. Jacquelain in our fifth volume, p. 452.—Ed. *Chem. Gaz.*

† The patent for bleaching and purifying dark tallows and deep-coloured oils was taken out about twelve years ago by the writer.

manageable, and is quite as expensive and much more troublesome. Another method is by blowing air through the goods, heated to a certain point. This also is found not so effectual as the chromic process, for there is considerable waste, and when made into soap the colour is much inferior.—*Chem. Gaz., from Newton's Journal.*

MINUTES OF THE PHILADELPHIA COLLEGE OF PHARMACY.

At a Stated Meeting of the Philadelphia College of Pharmacy, held at their Hall, Ninth Month, 25th, 1848. Present seventeen members. The President in the Chair.

The minutes of the Board of Trustees were read and approved. The name of Athanase Roidet was proposed as a Resident member by the Board, and the College proceeded to the election. The tellers reported he had received the requisite number of votes, and he was declared duly elected.

The Committee on the Adulteration of Drugs made the following Report, which was accepted, and the Committee continued.

To the Philadelphia College of Pharmacy.

The Committee continued from the last meeting, having in charge the subject of adulterated drugs, &c., and the preparation of a book of tests, &c., for detecting adulterations, beg leave to state, that since their last report the favourable action of Congress has been had in reference to imported drugs, and the bill has become a law and is now in operation.

Your Committee have every reason to be satisfied with the powers of the bill, and believe, if properly enforced, it will be productive of great benefit to the drug market.

In regard to the "Book of Tests," your Committee are not prepared to report, and ask to be continued.

On behalf of the Committee,

DANIEL B. SMITH, Chairman.

The Committee on Latin Labels are continued to report when prepared.

The Committee on the Cabinet of Specimens made the following report, which was accepted, and the sum of fifty dollars, in addition to the former sum of that amount, was appropriated to their use.

To the Philadelphia College of Pharmacy.

The Committee appointed at the last general meeting in reference to the Cabinet of Specimens, &c., report: that they have not as yet proceeded with the arrangements for containing the collection of specimens, owing to the insufficiency of the appropriation fully to cover the cost of the cases, bottles, &c. They therefore ask an additional appropriation of fifty dollars, to be called for during the next year, and believe that they will then be enabled to carry out the objects of their appointment in a satisfactory manner.

On behalf of the Committee,

CHARLES ELLIS,
SAMUEL F. TROTH,
EDWARD PARRISH,
WILLIAM PROCTER, JR.

The Committee appointed to distribute the Code of Ethics, and to confer with a Committee of the College of Physicians on matters connected with the interests of both

professions, made the following report, which was accepted and they continued.

To the Philadelphia College of Pharmacy.

The Committee to whom was referred the subject of the Code of Ethics, and who were authorized to confer with the Committee of the College of Physicians, report :

That they have caused to be printed and circulated, the "Code of Ethics" as adopted by the College, both in the form of cards for the use of the members, and in the Journal for general circulation. They also sent copies of it to the College of Physicians, and to the National Medical Convention, which bodies, we understand, have viewed it favourably.

The Chairman of this Committee having received a communication from the Committee of the College of Physicians, (signed by Drs. Condie, Jackson, and Bond,) stating their readiness to confer with us on subjects interesting to both professions, a meeting was appointed at the College Hall, which was attended on their part by Drs. Bond and Jackson. Dr. Condie being absent, his colleagues were not prepared to offer any subjects for the consideration of our committee. On our part a paper under the head of "Points worthy of notice in a conference with the committee of the College of Physicians," was read. It was intended to be merely suggestive of topics for discussion. A copy is appended.

The gentlemen of the College of Physicians appeared to admit the importance of most of the "points" suggested, but did not seem disposed to propose any course of action in regard to them. The joint committee adjourned with the understanding that the College of Physicians committee hould be furnished with a copy of the "Points for Con-

sideration," and when they were prepared to meet us again, to inform the chairman.

On behalf of the Committee,

DANIEL B. SMITH,
SAMUEL F. TROTH,
DILLWYN PARRISH,
H. C. BLAIR,
WILLIAM PROCTER, JR.

The following proposition was submitted, and on motion was laid on the table for consideration at the next stated meeting.

To the Philadelphia College of Pharmacy.

The undersigned propose to alter Law fifth, Section second, of the laws of the College, so as to read as follows:

Section 2d. Any graduate of Pharmacy, producing the diploma of a respectable College of Pharmacy, and conforming in his professional conduct to the Code of Ethics adopted and published by this College, shall be eligible to resident membership by vote of the Board of Trustees in the manner prescribed by the By-Laws of the Board.

Any apothecary of known qualifications, removing to this city from a locality where it would have been impracticable to obtain a diploma, and subscribing to the aforesaid Code of Ethics, or any reputable member of the medical profession, being recommended by the Board as a candidate for election, may be elected a resident member by an unanimous vote of the College.

JOSEPH C. TURNPENNY,
WILLIAM J. JENKS,
AMBROSE SMITH.

The College then proceeded to the election of eight Trustees. Daniel S. Jones and Robert Shoemaker were appointed tellers, who reported that the following members

had received the number of votes necessary for an election, whereupon they were declared duly elected.

Thomas P. James,	Robert Shoemaker,
Jacob L. Smith,	John Harris,
Ambrose Smith,	William J. Jenks,
Alfred B. Taylor,	Caleb H. Needles.

Then adjourned.

DILLWYN PARRISH, Secretary.

Editorial Department.

Act of Congress on Adulterated Drugs.—Our readers will perceive that we present them a copy of the Drug Bill recently passed by Congress, the Circular of the Secretary of the Treasury department to the Officers of the Customs, together with a preamble and resolutions issued by the New York College of Pharmacy, addressed to their members and others, recommending a strict construction of the law, &c.

When we consider the crying evils which have so long existed in this department of foreign importations, and the almost unprecedented unanimity with which Congress acted in passing the Bill, we cannot but believe that the time has now come for a new order of things amongst us. We trust that soaked rhubarb, *remade* opium and scammony, and 7 per cent blue mass, will no more be seen in our warehouses, and that the retail dealers will take proper means to see that these evils, greatly heretofore of foreign growth, be not transplanted amongst us. We are not of those who believe that adulterated drugs are solely of foreign origin. The men who will buy up rhubarb that has soaked for two weeks in the waters of the ocean in a sunken vessel, dry and powder it, and then disseminate it through the country, (and there are such in our midst,) will not scruple to adulterate opium, blue mass, or any equally important remedy, if they can only do it so as to avoid detection. Therefore, whilst we rejoice in the advance made by the act of Congress, we would urgently press upon those country physicians and retail dealers, who *really desire to have pure medicines at fair prices*, to take every means to improve their knowledge of drugs, and to expose any impositions to which they may be subjected.

Some years ago the business of sophisticating drugs was carried on to so great an extent in Great Britain, that the matter claimed the attention of Parliament; whose committee with proper powers entered into an investigation of the evil. In the testimony that was adduced it was shown, that the difficulty arose as much from the consumer as the manufacturer.

The competition between the retailers in the country towns, brought about by the people buying on the cheap principle, induced them to urge the city druggists to send them drugs and chemicals that they could sell at a stated price. The druggist writes to the manufacturing chemist that his customer wants nitrate of silver, blue mass, mercurial ointment, etc., at a certain price, and queries if he can make them at a figure low enough for him to get a profit. We believe that this state of things exists amongst us, and is largely the cause of the very importations against which the Act is levelled. In our country villages, both east and west of the Alleghanies, a large amount of medicines are sold by country store keepers who know as much about bark, rhubarb, and opium, as they do about algebra or conic sections. They bring the same rule to bear on these important remedies as they apply in purchasing mustard and spices, and are treated accordingly. There are hundreds of persons who are nominally apothecaries, over the country and towns, who are little better; and in coming eastward to make their purchases have a tariff of prices to hold up to the druggist who may expect their patronage. Unfortunately, competition is so great that many are compelled to forego all profit, or sell bad articles, a temptation sorely trying to men who have families to support.

In reference to the working of the Act, much will depend on the ability and the integrity of the officers in whose hands the government commits it for enforcement; as well as on the principles adopted in the inspection. We believe it is highly important that these gentlemen should act with the most perfect unanimity in their examinations; that the standard for New York, should correspond with those of Boston, Philadelphia and Baltimore, else there will be no certainty in the result. In view of this, a frequent correspondence between these officers would be productive of advantage, and it is very desirable that they should see the importance of keeping such full and lucid records of drug importations, both in reference to weight and value, that their registers will be an invaluable statistical table.

We understand that Dr. Baily has the appointment for New York, and Dr. David Stewart that of Baltimore, whilst in this city our colleague, Alfred B. Taylor, is the incumbent. We have not heard of the appointments for the other ports, but have reason to be satisfied with the gentlemen above named. They will have an onerous and perplexing duty to perform until the standard for judging certain drugs and chemicals is definitely settled by experience, and whilst we urge them to adopt a fair and safe ratio of strength, would recommend that every facility, consistent with a conscientious discharge of duty, be conceded to

importers in the *first period* of their action. We learn from our friend John Milhau, President of the New York College of Pharmacy that "So far, there have been no serious objections evinced, on the part of importers, to the practical application of the law. Some difference of opinion exists as to the per centage of morphia which good Turkey opium should contain, to entitle it to pass the Custom house. The Inspecting Officer of this Port inclines to the belief that 9 per cent should be the minimum standard." "This, we will admit, is an article of such importance to the physician that it should never be admitted into the country except it be of sufficient strength to be available at the ordinary doses. As matters have been, we have such reason to fear that the better kinds of opium were purchased by the manufacturers of morphia; the inferior qualities remaining to supply the various forms under which opium is administered." It would be very desirable that no opium containing less than 9 per cent. of morphia should be used, but we fear that a very large proportion of so called prime opium will not reach this strength. The frequent essaying of these products will soon give us the true state of the opium market, and a standard can then be fixed on a rational basis. And so in reference to other articles of an organic nature, containing active principles.

Prescription Blanks.—In our last number we noticed a prescription blank, suggested by our friend Edward Parrish. The idea appears to have been approved by apothecaries, as we observe numerous *editions* have been issued by others, differing little from the original suggestion. In some, however, we observe the apothecary's name has been attached, which is in our opinion so objectionable a feature as to induce us to suggest to our pharmaceutical brethren its indelicacy. There is no physician whose practice is confined to one neighborhood and they cannot be expected to carry a variety of blanks to suit the various districts or stores; hence in using such blanks he is subjected either to the necessity of removing the name, or to the implication of being partial in his patronage.

Vallet's Pills of Carbonate of Iron.—Every apothecary is aware that however consistent the mass pill, ferri carb.; of the U. S. P. may be at the time it is made into pills, its deliquescent nature soon causes them to attract sufficient moisture to soften and run together in damp weather. We have found it very convenient to prepare a quantity of the officinal pills in the following manner, viz.: We take a a plate of tinned iron, place on it as much of the mass as is sufficient

for two or three hundred pills, and hold it at such a distance above a lamp or other source of heat as is sufficient to cause evaporation, whilst the mass is constantly kept in motion with a spatula, observing that no carbonic acid is evolved by too great a temperature. As soon as a small portion of the mass will splinter after cooling, when crushed, the plate is removed and the hot mass made up rapidly into pills of three grains each, which are kept closely stopped in a bottle. When more than a dozen of these pills are dispensed in a prescription they should be enclosed in a wide mouthed vial which prevents all chance of deliquescence.

Nitrate of Silver.—We are often called on by physicians to point a stick of lunar caustic for convenient use. Several modes are in use: by solution, by mechanical force, and by casting in a mould; but by far the most expeditious and easy method is the following: Take a silver coin, (say half a dollar,) hold it with a pair of forceps over the flame of a lamp until it is hot enough to fuse the nitrate, then having the cylinder of caustic in the right hand, between the thumb and index finger, holding it at an angle of 30 or 40 degrees with the surface of the coin, pressing the point on the latter and turning the cylinder as the part in contact fuses off. A little practice gives great dexterity; and a point of any required acuteness may be obtained, whilst the excess of the salt on the surface of the coin can be returned to the bottle.

Pharmaceutical Apparatus.—M.M. Weiss and Schively, importers of this city, have recently received from Lowig of Germany, a set of pharmaceutical apparatus which exceeds anything of the kind that we have before examined. It consists chiefly of a furnace, copper boiler, block tin still, block tin vessels, for infusing, boiling and evaporating by steam heat, varying in size from a pint to several gallons, and most of them fitted with block tin covers. Besides there are porcelain vessels and iron dishes; at one side is a large copper reservoir for water, which equally supplies the boiler and refrigerates the condenser, and the still is so arranged that a current of steam may be passed under a diaphragm within it as is proper in the distillation of certain plants and distilled waters. The whole is got up in a most elegant style, and is calculated for the conduction of a variety of operations at the same time. The whole arrangement is got up with a view to satisfy the law of the Prussian government, recently promulgated, which requires the Apothecaries to make all imprisms, decoctions, and in tin vessels with steam heat.